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ALBERTA NATURALIST

Alberta's Natural History Review

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Results of May Species Count 1991

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CONTENTS

President's Page 1
Loran L. Goulden Award 1
Changing the Flow 2
Red Rock Coulee Natural Area 6
Geology of Red Rock Coulee 7
Plant Families of Dinosaur Prov. Park 8
South of the 50th Parallel 11
Forest Age and the Abundance of Songbirds 13
Seeing May Be Believing 17
Book Reviews 19

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The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research, and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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President's Page

R. Barry Jenkins

I have taken on this position of President of the Federation of Alberta Naturalists with a mixture of anticipation and trepidation. I am a completely amateur naturalist with almost no formal training in any natural history area. What little I know I have learned from those wonderful people who are willing to share their knowledge with us willing, but ignorant, students of our world. I hope my time as president of this organization will in some way help repay my debt to these mentors who continue to teach me and all those other amateur naturalists in the clubs throughout the province. It is you who share your knowledge and whose patience and enthusiasm make these organizations so much fun.

The trepidation comes from the knowledge of what has to be done in the next two years and in the knowledge that there will be many surprises, and not all pleasant ones, ahead. When I became president of the Wagner Natural Area we were looking forward to preparing an educational package for schools on wetlands but within weeks of my becoming president we were informed of the plan to build a road through the Natural Area. The education package was dropped and we spent the next two years doing what we could to stop, move or at least mitigate this plan. We didn't stop the road, but with a lot of help from many of you, we did both move and mitigate it.

The completion of the Bird Atlas is near at hand with all the problems of final printing, distribution and sales. The inevitable dissatisfaction from some of the contributors in the final Atlas will, I expect, be a painful problem. The Atlas will be a wonderful publication; colourful, informative and as accurate as we can make it, but perfection is impossible. There will be, hopefully, only minor errors in the Atlas and it may not be exactly as envisioned by some people. I hope these problems will be minor, but I recognize how much effort and time many of you have spent on this project and your desire for it to be perfect. If you have any concerns please contact me or Glen Semenchuk, the editor of the Atlas, before it goes to press.

I expect I am also taking over as president just as the anti-environmental backlash is about to pick up momentum. With depressed markets for almost everything produced in Alberta, from wheat to pulp wood, I anticipate that the argument that jobs are more important than the "wishes of a few tree huggers" will be heard more often and even believed. Our perceived position as "a voice of reason" in the environmental movement will be challenged from both sides. We will have to do some soul searching to see where we can or will draw a line in compromise with government and, to a lesser extent, industry.

It should prove to be a very interesting two years and I am looking forward to getting out to as many of the member clubs as I can. I love exploring Alberta and I cannot think of a better way to do it than by getting out to the member clubs and having you show me your area.

Loran L. Goulden Award Presented to Myrna Pearman

Ken Larsen

Myrna Pearman has been awarded the prestigious Loran L. Goulden award by the Federation of Alberta Naturalists. This award is presented annually to people who have made an outstanding contribution to natural history in Alberta. Myrna adds luster to already illustrious company. Past recipients include wildlife artist Dick Dekker, W. Ray Salt, co-author of The Birds of Alberta, botanist Dr. Charles Bird, ornithologist Martin McNicholl and pioneer environmentalist, author and naturalist Kerry Wood. Myrna served on the board of directors of FAN for three years and was a regional coordinator for FAN's Alberta Bird Atlas Project (1987-1991). She has been a director of the RDRN since 1983 and has served as president and program committee chairperson. While on the board, she helped

continued on page 10

Myrna Pearman erecting nestboxes with helper, Ken Brown.
Photo by Jim Robertson

Changing the Flow
Address to the Canadian Nature Federation Annual General Meeting 1991

Kevin Van Tighem

....Before I tell you about what has been happening recently down by the river, we should make sure we are all talking about the same thing. Most people whom I've asked describe a river as: "water flowing in a channel." This is not a river. This definition could define an irrigation canal, a sewer, or a gutter. A river is a living ecosystem. Running water is its heart, but it is a dynamic, integrated, evolving complex of water, sediments, living creatures, landscapes and cycles. It is far, far more than simply running water.

There used to be a guy named Rene Descartes who figured that all of Creation was mechanical and that only humans, who had been especially blessed by the Divine, were capable of feeling. He argued that the living world was like a Swiss clock - gears and switches and mechanisms all fitted together, mindlessly clicking away. But, he said, since man was touched by Divinity, all of life had an unconscious affinity toward mankind and, in fact, dumbly duplicated human behaviours. Descartes was famous for his mathematical theorems, which you may recall learning in school. He was also famous for mutilating dogs.

As the dog screamed in pain, Descartes would point out to his audience how remarkably the dumb mechanism, mimicked the true pain. How noble the human being, that dumb mechanisms should so eagerly emulate them!

While Descartes was de-limbing dogs, Alberta's rivers flowed free and clean through a healthy, natural landscape. The people who lived along those rivers did not consider dogs to be dumb machines and they did not consider themselves separate from, or superior to, nature.

Descartes' version, unfortunately, won out. The technological and scientific revolution that displaced God, Nature and indigenous people over the subsequent centuries was founded on the premise that Earth exists for human use above all else, humans are separate from nature, and if we can apply the cold-hearted science of Descartes and his peers to ecosystems, species, genes and minerals, then we can re-create the world as God would have done originally, if He'd had time.

It's great to be alive in this era, though, isn't it? Here we all are, having crossed dozens of ecosystems in a few hours by plane or bus or car. We are going to eat food this weekend that comes from southern Alberta, California, Brazil -- all around the world. Coal-fired electrical generators provide us with air-conditioning during this hot July weather. We are assured abundant clean water because the Red Deer River has a big dam on it that evens out its flow all summer.

But are we better people for it? Are our ecosystems, and the rivers that flow in their hearts, any better? Can we keep this up forever? And if we keep this up, will there eventually still be an Alberta?

My family has been in Alberta since 1885. I'm deeply proud of that. Being an Albertan, it seems to me, is a unique and special privilege. Stan Rowe talks about Earth as our Home Place, but to me our real home places are the ecosystems that resonate inside each of our souls and our hearts. We are on Earth, but we are of our home landscapes. Human beings cannot exist out of context. For Albertans, their context is Alberta.

....While we work at re-making Alberta's environment in Descartes' image, we must never forget that it is our environment, ultimately, that makes us who we are. If we want to be Albertans, we need to ensure that Alberta survives our engineers and our economists.

If there are no cottonwoods along the lower Oldman a century hence, no caribou in the riparian forests along the Little Smoky, no Peace-Athabasca delta, and no wild rivers where young people can learn awe and humility, then it's legitimate, I believe, to ask if there will still be any Albertans. If we can't sustain our rivers and the landscapes that give them their vitality, then how can we possibly sustain our identity as citizens of this place?

We often hear talk about "our rivers". Indeed, these are "our" rivers. But what does "our" mean?

Gail is "my" wife. Likewise, I am "her" husband, and we both refer to the three little people who share our lives as "our" children.

What do all those possessives mean?

Certainly, I don't own my family in the sense that I control them. I didn't buy them or inherit them. I can't sell them. And yet, I own them as much as I own anything in the world. I own them, because they love me. They love me, because I try to earn that love. I try to earn that love, because I love them. So it goes.

Ownership in this sense is based on love, not legal rights. If I were irresponsible - if my focus was more on what I can take than on what I should give, then they might well cease to be mine. You can only own that which you love. And so, really, to own is not to possess or control: it is to love and nurture. Ownership is earned not bought or inherited.

What has this to do with Alberta rivers? I think it has everything to do with them. Our ownership of them after all, seems based more on taking then on giving.

....When the great ice sheets retreated from this piece of Earth's mosaic there were no human beings of any sort to claim ownership of the newborn meltwater rivers.

Later, waves of people came and went, camping by the rivers and hunting the colonizing herds of animals.

We are like a bunch of greedy brats fighting over their mother's estate, while she sickens from neglect on her deathbed.

More glacial cycles came and went, each changing the face of this place a little more, each bringing new waves of extinction, colonization and change by plants, animals, people.

Who owned Alberta then? Who loved its rivers? We'll never know.

In the past century or two, however, we've repeatedly tried to stop the movie and carve out bits of this unfolding tapestry, calling them "property". Descendants of natives who lived here when the treaties were signed claim ownership of land, rivers and wildlife based on where they lived in the 1880s. The white-faced hordes who descended upon this landscape asserted their own illusions of ownership.

Today, everybody is at everybody else's throats, claiming precedent, occupancy, need, purchase (from whom? from God?) and other reasons why they own more than the other guy. We fight bitterly over what we consider the whole point of ownership -- freedom to exploit what used to be called Creation but is now just "natural resources." We are like a bunch of greedy brats fighting over their mother's estate, while she sickens from neglect on her deathbed.

The province wants the feds to butt out so that it will be free to exploit its river. Municipalities claim first dibs on river water, while irrigators demand more free dams to get their share. Industry buys rights to dispose of wastes in rivers. Native people wave their treaties to show that they got ownership of rivers a century ago (again, by whom?), infuriating the latecomers who think white families are more important than native ones.

The question, however, is: where do love or responsibility figure in any of this?

How can anyone claim to own any part of an Alberta river if we only want the right to exploit those rivers, rather than to nurture and sustain them? Can a person who abuses another person claim to own that person? Can a society that deliberately abuses rivers claim to own those rivers? I don't think so.

The people who own Alberta's rivers, I believe, are those who care about them enough to work and sacrifice to see them restored, nurtured and protected from greed.

Our rivers have many owners by this definition. But those owners have little control over what others do to the rivers we love.

Those who see rivers primarily as resources to be exploited have no claim to ownership and, at their worst, are guilty of the same abusive, perverted, self-centred greed that drives some people to abuse and exploit other human beings. By the same token, those who treat rivers as technical problems to be solved by better engineering, and those who consider those who love and value living rivers as just one set of so-called stakeholders, betray an amoral lack of humility and love. They own nothing but their own arrogance.

....Don't let anybody ever tell you that love is not, in truth, the most essential ingredient in a sustainable future for our rivers, our land, our planet. It is, in fact, the missing factor in the equation of the Technological Era.

Because what has our faith in unemotional, pragmatic science given us to date? Let's look at just a couple of examples: dams and pulp mills.

In Alberta today, we have very few undammed rivers left. There are dams on the St. Mary's, Waterton, Oldman, Little Bow, Bow, Kananaskis, Ghost, Red Deer, North Saskatchewan, Brazeau, Paddle, etc. etc. This makes sense since rivers are merely dumb mechanisms put there to serve the advancement of human civilization...right?

But what does a dam do to a river? If it is a flow regulation dam like the Red Deer's Dickson Dam or the Oldman's Three Rivers Dam, it traps the spring flood and releases it gradually through the summer, fall and winter so we will have abundant water for irrigation or other uses when we need it. If it is a hydroelectric dam like the ones on the Kananaskis, upper Bow and Brazeau, it stores water and pushes it through turbines whenever people use lots of electricity. In the case of the Kananaskis, it's turned on at night and during the winter.

Just think. For millenia, life evolved and diversified along these rivers. Cottonwoods synchronized their life cycles with the June floods, releasing their seeds at just the right time to take advantage of the seasonal peak in water and silt. Elk and moose learned to sequester themselves on highwater islands to keep their newborns safe from wolves and bears. Fishes used the spring flush, the damming of backwaters and tributaries by high water in the main river, and the natural rhythm of the rivers to spawn or rear their young.

You cannot tinker without consequences. On Alberta's dammed rivers, everything has been thrown out of whack. Animals and plants must suddenly cope with ecosystems that operate by new rules; rivers that follow patterns that never existed before in nature. Ever.

This is why trout are virtually extinct in the Kananaskis River. This is why the Peace-Athabasca Delta has lost almost 60% of its wetland vegetation in the past 20 years, most of its muskrats, a lot of its bison. This is why cottonwood forests are disappearing from our prairie rivers.

We also have pulp mills. In the past three years, we've been generously given nine new or expanded pulp mills along our northern rivers.

Bleached kraft pulp mills at Hinton, Athabasca, Grande Prairie, Peace River and upstream on the Peace River in B.C. dump tonnes of organochlorines into northern Alberta rivers daily. Many of these organochlorines are highly toxic and they do not break down. Already, dioxin and furan contamination has been found at dangerous levels in fish in the Wapiti and Athabasca Rivers, and ALPAC isn't even built yet. With organochlorine contamination in northern rivers, and mercury contamination below dams on southern rivers it looks like time to pack away the fishing rods. Northern native people, of course, don't have that luxury.

We also have mechanical-thermal pulp mills in Alberta. They don't spew out the same dangerous chemicals, but they do spew out tonnes of organic sludge that rots in the water, using up oxygen. At least four Alberta pulp mills are consistently out of compliance with even Alberta's generous pollution limits.

The rivers don't just suffer from what comes out of pulp mills. They suffer from what goes in. A river really extends up to the watershed divide, since the forests and grasslands are what trap and store rain and snowmelt, releasing it gradually to the springs and streams that feed the rivers. Changes to the watershed are inevitably reflected in the river. Clearcutting thousands of hectares of natural forests each year to feed the hungry mills is already changing rivers. More spring floods, lower summer flows, increased sedimentation...and so it goes.

Derek Doyle, the founding Chairperson of the Rivers of Canada Foundation, was the keynote speaker at this spring's Flowing to the Future conference. He entitled his talk "Rivers -- the Report Card of Civilization".

What a perfect title. Because if you go down to the river and look at its floodplain, examine the life in the backwaters, see how clean the gravels are and whether the fish are laden with contaminants; if you look for the people picnicking in shady cottonwood groves or floating in canoes on clean, sweet-smelling riffles -- then you have the true measure of Alberta's commitment to sustainable development.

It's easy for politicians, industrialists, you or me to stand up and say that we care about the environmentally-sustainable development. Words are cheap. The river does not lie. When Alberta Environment says that it is committed to ensuring safe minimum flows in southern Alberta's rivers, those are words. When the

Highwood River flows once again at only 70 cubic feet per second, and the lower Bow River is so dry you can walk across it without wetting your ankles, that is truth. Rivers are indeed the report card of civilization.

....We, collectively--you and I--are this civilization. That's our report card. It's up to us to improve our grades. This is our home place, those rivers are our responsibilities, and we live in one of the most free and democratic societies on Earth. We are also all extremely affluent by world standards. We have a lot of power.

This is our home place, those rivers are our responsibilities...

What should we do, then?

Take stock of your home river. Find out who is responsible for its watershed. Monitor the public announcements in your local paper and when you see a land use application, zoning change or other proposal, get on the phone and remind the powers that be that their decision will affect a river's health, for better or worse. Test every thing you or others do by whether it will protect the river, improve the river, or make the river worse. Accept no compromise! We've compromised too far already. If we aren't using our telephones and our postal service to nag, cajole and persuade, then we are part of the problem. It's that simple.

We have power, as individuals and groups, to improve our civilization's report card. The Canadian traditions of participating in democracy only once every four years, being nice, trusting in bureaucracies, and avoiding conflict, simply will not do any more. Our rivers are telling us that. That is what our rivers are: proof of whether we just want to cluck our tongues and look concerned, or whether we really do believe in sustaining our future.

If our rivers are sickened, over-engineered or dying, then so is the society they support. If we can sustain our living rivers, we can sustain our home places. If we can take pride in the health of our rivers, then--and only then--will we have the right to be proud of ourselves.

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Cattle Egret Sighted at Erskine Lake

Lloyd Lohr

When Secondary Highway 835 leading south from Highway 12 near Erskine, Alberta was re-routed several years ago,it involved building a wide road across the eastern portion of Erskine Lake. This lake is an accumulation of run-off water draining in mostly from the east, southeast and south. The lake now has managed outlets into the Sucker Creek channel,which joins with Tail Creek about 2 kilometres from it s entry into the Red Deer River at Content Bridge.

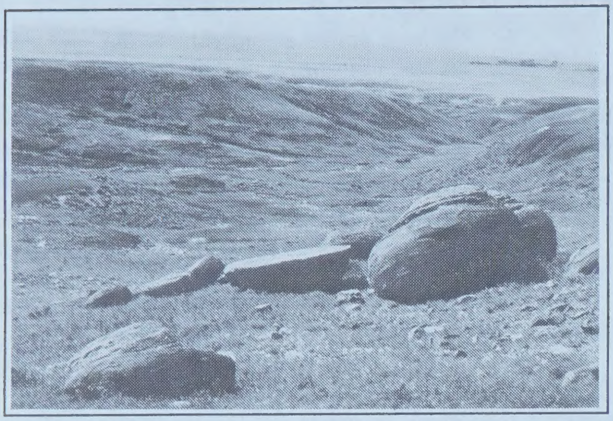
The western portion of the lake,under normal conditions,is an important staging area for waterfowl and has a bait feeding station and an observation tower. The eastern portion is shallower and is an important waterfowl nesting and rearing area. Across the middle of this was where the new road, one kilometre long, was constructed. To minimize the disruption of habitat and waterfowl movement and improve nesting conditions, a number of holes were dug by power shovel. This gave extra reservoirs of water during drought seasons and the dirt piles provided loafing and nesting islands. Also, a number of stone pile nesting sites, topped by old car tires, were added,that are utilized by nesting Canada geese.

The waterfowl have adapted remarkably well to the traffic and are easily observed from the roadway, making this one of the better wildlife viewing sites. On August 15, 1991, about 9 am I was slowly driving along observing the many kinds of waterfowl. Something white in a reed patch about 75 metres to the west caught my eye. As I reversed and reached for my binoculars, a white bird took to the wing and flapped over the weed patches and dropped out of sight. However, I was able to recognize the shorter and thicker neck of the cattle egret (*Bubulcus ibis*), having seen them in Florida. Also, when the bird first flushed I had a good view of the darker buffy colouring across the shoulders that these birds show in breeding plumage. An alert was put out to some of our Buffalo Lake Naturalists but no further observations were reported.

Author's Address: Box 1414, Stettler, Alberta TOC 1LO.

Red Rock Coulee Natural Area

Ivan Shukster



Photos by Joyce Gould

An unfortunate fact of life is that we too often do not make the extra effort to see places of natural, historical or cultural significance in our own home area unless we happen to have visitors; then, with pride, we take them to those sites. We often assume that we have plenty of time, that both we and the special places will always be here. If you fall into this category, invite guests to your home this summer, and "force yourself" to see the Red Rock Coulee Natural Area.

Red Rock Coulee was designated as a Natural Area in 1970. As a natural area, it is protected from development. Its most significant features are the red rocks themselves. The story of these concretions (or "concreations", as the signs mistakenly state) is explained by Hope Johnson in the article following. A National Geographic article (August 1969) dealt with the only other similar structures in North America, those occurring in New Mexico.

There is more to Red Rock Coulee than the structures that give it its name. During the winter, I watched a herd of 43 mule deer browsing in the southern portion. Other mammals are jackrabbits, Richardson's ground squirrels (gophers) and the bushy-tailed wood-rat. Reptiles one may encounter include prairie rattler, bull snake and the short-horned lizard. You may also have the opportunity to view sage thrashers and rock wrens.

Several plant communities are represented in the 325-hectare area. The largest community is the *Stipa comata - Bouteloua - Phlox hoodii - Parmelia chlorochroa* community. Plant communities are named for their dominant or indicator species, and this community could also be called (in English) the spear grass - grama - moss phlox - *Parmelia chlorochroa.* (Sorry, no common names for many of the mosses and lichens.) *Parmelia chlorochra* is the small yellowish lichen so prevalent in our grasslands. This community covers over 40% of the surface. The second largest community, one that is only slightly smaller, is the (here we go again with the Latin!) *Artemisia longifolia* (sage) - *Atriplex nuttalii* (salt sage) - *Hymenoxyis richardsonii* (Colorado rubber weed) community. The third, and smallest by far, is the *Juniperus horizontalis* (creeping juniper) - *Symphoricapus occidentalis* (wolfwillow) - *Rosa arkansana* (prairie rose) community. The fourth community to notice on your hike is the *Scholochloa festucacea - Juncus balticus* (wire rush) - *Spartina gracilis* (alkali cord-grass), the plants you will find in wetter areas. There are many beautiful flowers you can look at or photograph throughout the growing season. You will notice that the showy flowering plants are rarely sufficiently common to be included in the communities' names, but that does not make them any less important to the ecosystem.

During your hike around Red Rock, check out the sometimes subtle and sometimes dramatic borders between the plant communities. You cannot help but notice also the effect that water erosion has had on the land. Water erosion is the most important physical factor in the creation of the gullies, rills and coulees. The existence of the four different plant communities in the natural area are direct responses to water or the lack of it.

Inspiration! Awe! These are some of the sensations that occurred to me when I first set foot into Red Rock Coulee Natural Area. The special magic of the place is that these sentiments are still felt on every subsequent visit. And I know that I am not alone. Regional artists have used the landforms of Red Rock Coulee in their paintings, drawings and sculptures.

For those who are not familiar with Red Rock, it is only 56 kilometres from Medicine Hat on secondary highway 887 south of Seven Persons. Both *A Nature Guide to Alberta* and *Alberta Wildlife Viewing Guide* have sections on Red Rock, an indication of its strength as an attraction. Just one last note: you do not have to wait for out-of-town visitors to enjoy Red Rock. Hop in your vehicle and head right out to look and enjoy. This is an area that is protected for the future but deserves to be viewed right now.

(Reprinted from Sagebrush Chronicle, June 1991)

Author's Address: Box 1365, Redcliff, Alberta T0J 2P0.

Geology of Red Rock Coulee

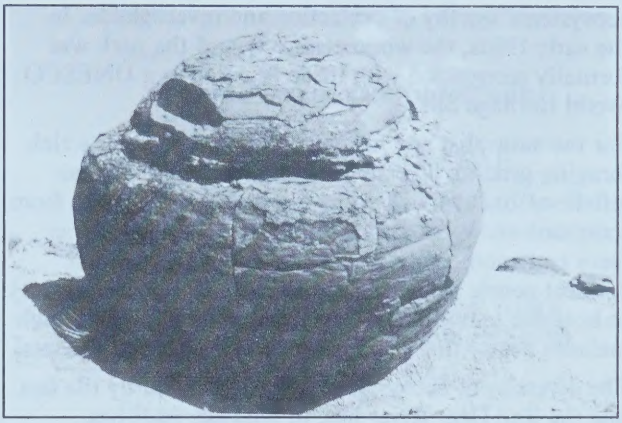
Hope Johnson

At the eastern edge of the coulee, we are standing 3,350 ft (about 1,100 m) above present world sea level. The soil cover is very thin, and walking down we immediately find ourselves in an eroded area of decayed sandy shale plus some very bentonitic mud,out of which large rusty spheroids are weathering. These are reported to be the largest anywhere in the world (most are about 2.5 m in diameter). The pale to medium grey sediments are mainly marine mud, once the bottom of a shallow sea of 69 - 75 million years ago. This stage in the geological history of our area is called the Bearpaw formation. (The word "stage" is coming in to use as a substitute for "formation". Formation will persist in some texts.) It stretches from south central Saskatchewan to west of the present Rocky Mountains at higher altitudes. At above 3100 ft on the plains this sediment has been removed by glaciation.

The remarkably symmetrical concretions are a puzzle because many show an internal ringed structure. In addition, it is difficult to understand how sand and iron compound(s) could sustain the regular shape without much more flattening. It is believed that they must have formed in very soft sediments well mixed with sea water - a gooey suspension. While many contain fossil sea shells in their outer part,there seems no evidence of a fossil core. The rust colour, from hydrous iron oxide, is unlikely to have been the original colour. Many bacteria excrete iron compounds and,indeed,other metallic compounds, as a byproduct of their metabolism.

Many marine fossils have been removed from this area during the past years, especially the rather flat, spiral shells of a species called *Placenticeras meeki (synonym is* P. whitfieldi). The small clams called *Phelopteria linquaeformis* are found in small grey concretions, often with a mass of algal (seaweed) fibres. At another exposure of this Bearpaw shale, on the Black and White Trail some 17 miles south of Medicine Hat, the small patterned "clam" (bivalve) *Liopistha undata* is quite plentiful, along with many large spheriods.

At lower levels to the west the surface drops below 3100 ft, and we pass into an earlier stage, similar in rock type to that seen in Dinosaur World Heritage Park, northeast of Brooks. The walls and blocky outcrops of rilled pale sandstone are bound together by clay. This rock is the record of sediments brought by freshwater streams and ponds which had built up on the western edge of the inland sea (Cretaceous Arctic to Gulf Seaway). It lies below the marine shales because some 75 million years ago the sea floor (a geosynclinal trough) sank rather quickly, inundating the delta lands to the west.



The dinosaurs and their land contemporaries would have had to migrate westward to survive. Dinosaur remains of late Cretaceous time are found west of the Rockies in British Columbia. These sandstones, bentonitic shales and ironstone beds are called the Oldman beds of the Upper Judith River formation. Here at Red Rock Coulee it is possible to find many unidentifiable fossil bone fragments. Careful search has identified broken carnivorous dinosaur teeth, fragments of hadrosaur grooved jawbone; a scrap of a tail vertebra of a bird-mimic dinosaur, and some turtle plates.

All over the surface of the coulee,in patches, are deposits of stones brought in by glacial action - i.e. till. One would expect it all to be derived from the Keewatin (eastern) Ice Sheet, but the presence of fairly large concentrations of quartzite stones,plus some green and red shale fragments,indicate contributions from the Cordilleran (western) Ice Sheet. This area would repay further geological study.

(Reprinted from Sagebrush Chronicle, June 1991)

Author's Address: Box 614, Redcliff, Alberta T0J 2P0.

Plant Families of Dinosaur Provincial Park

Richard D. Revel

Dinosaur Provincial Park in south central Alberta straddles the Red Deer River and includes some of the most exciting and interesting terrain to be found in the plains area of the province. It is world renowned for Cretaceous dinosaur fossils,which were the prime reason for its initial designation as a provincial park in the early 1950s.

Since its declaration as a park, many marvelous attributes in addition to the Cretaceous fossils have come to light,and the park is seen as a collection of world class ecosystems worthy of protection and investigation. In the early 1980s, the world class status of the park was formally recognized with its designation as a UNESCO World Heritage Site.

For the naturalist and historian the park presents a rich foraging ground: diverse geological attributes characteristic of badlands topography, a wealth of wildlife from scorpions and rattlesnakes (both rare) through to deer (very common), cultural features and history which connect people to their environment,and the opportunity to botanise to one's heart's content among a flora which includes nearly three hundred species of vascular plants.

The diversity of ecosystems is brought about by the fact that the Red Deer River has, in post glacial times, incised a valley several hundred feet deep through the mixed grass prairie. In response to the lowering river base level, steep sided coulees have back-cut at right angles to the river in their never ending quest for stability. Terrain characterised by north, south, east and west facing slopes,with everything from gentle to perpendicular angles in conjunction with river flats, flood plains and upland prairie,make this an ecological cornucopia second to none!

After one has enjoyed this naturalist's paradise, the scenery calls you to sit on the top of a butte, drink in the splendour and restore your soul.

Plant Families

For the amateur or professional botanist, the perennial problem in a location as diverse as this is trying to get a handle on the immense palate of plants which confront you. The botanical landscape changes radically as the days, weeks and months pass and the seasons come and go. It is no place for the unordered mind.

To assist those naturalists interested in botanical nomenclature I offer the following key to the families of vascular plants found in Dinosaur Provincial Park. The dichotimous key includes forty-one families of plants and requires a hand lens to use effectively.

Plants Not Angiosperms

Plants without flowers or seeds; reproduction by spores.

Stems hollow and jointed; leaves whorled; rough feeling.

EQUISETACEAE

Stems not hollow; plant low cushion-like or moss-like.

SELAGINELLACEAE

Low evergreen shrubs with low berry-like cones enclosing seeds; needles scale-like; plants aromatic.

CUPRESSACEAE

Angiospermous Plants

Herbs with alternate, entire leaves; parallel venation; flower parts in 3s.

Flowers not showy; plants grass-like; leaves linear.

Stems round and hollow.

POACEAE (GRAMINAE)

Stems round and pith filled.

JUNCACEAE

Stems triangular.

CYPERACEAE

Flowers showy; plants not grass-like; leaves various.

Ovary inferior.

IRIDACEAE

Ovary superior.

LILIACEAE

Herbs, trees or shrubs; leaves net-veined; floral parts in 4s or 5s.

Petals lacking or not fused together at any point along their length.

Petals absent

Plants woody trees or shrubs.

Petals absent although sepals sometimes petal-like.

Flowers in catkins, seeds with hairy tufts.

SALICACEAE

Flowers not in catkins; fruit a silver or red berry.

ELAEAGNACEAE

Plants herbaceous

Ovary inferior; leaves entire, hairless and somewhat waxy.

SANTALACEAE

Ovary superior and not attached to calyx (sepals).

Pistils numerous, calyx petaloid (Thalictrum).

RANUNCULACEAE

Pistils single; calyx petaloid or green.

Stamens 4; stigmas and style single.

URTICACEAE

Stigmas and styles more than 1.

Stipules united into sheath; calyx petaloid.

POLYGONACEAE

Stipules not united into sheath; calyx not petaloid.

CHENOPODIACEAE

Petals present and conspicuous.

Stamens more than twice as many as petals.

Stamens free from calyx.

RANUNCULACEAE

Stamens attached to calyx or attached to hypanthium.

ROSACEAE

Stamens less than twice as many as petals.

Pistils separate and more than one.

SAXIFRAGACEAE

Pistils single (may have ›1 united carpels).

Styles 2-5; separate near base.

Plants woody.

Fruit a berry; ovary inferior.

GROSSULARIACEAE

Fruit a bisamarra; ovary superior.

ACERACEAE

Plants herbaceous.

Ovary Inferior.

Inflorescence an umbel.

FABACEAE (UMBELIFERAE)

Inflorescence not an umbel.

SAXIFRAGACEAE

Ovary superior; sepals more than 2.

Ovary single celled; stamens 2 times the number of petals.

CARYOPHYLLACEAE

Ovary with 5 locules; stamens same number as petals.

LINACEAE

Styles 1.

Ovary inferior.

Stamens 5; fruit a berry;shrub with alternate leaves.

GROSSULARIACEAE

Stamens 4; ovary 2 celled; fruit a 2-seeded drupe; our species a many stemmed shrub.

CORNACEAE

Stamens usually 4 or multiples; fruit a many seeded capsule or a nutlet; herbs.

ONAGARACEAE

Ovary superior.

Flowers radially symmetrical; sepals & petals 4; stamens 6.

CRUCIFERAE

Flowers bilaterally symmetrical.

Leaves compound; fruit a legume.

LEGUMINOSAE

Leaves simple; fruit a multiseeded capsule.

VIOLACEAE

Petals fused together at some point along their length.

Ovary superior.

Plant parasitic and lacking chlorophyll; stamens 4.

OROBANCHACEAE

Plant chlorophyllous; not parasitic.

Corolla radially symmetrical.

Stamens same number as petals & opposite them; fruit a several seeded capsule.

PRIMULACEAE

Stamens not opposite corolla lobes;

Leaves basal; fruit a lidded capsule.

PLANTAGINACEAE

Capsule not lidded; stamens 5.

Inflorescence circinate; ovary 4 chambered.

BORAGINACEAE

Inflorescence not circinate; ovary 3 chambered.

POLEMONIACEAE

Corolla bilaterally symmetrical.

Fruit a nutlet.

LABIATAE

Fruit a 2 chambered capsule

SCROPHULARIACEAE

Ovary inferior.

Many individual flowers forming inflorescence which looks like single flower (eg. daisy); fruit an achene often with pappus.

ASTERACEAE (COMPOSITAE)

Flowers not grouped to form single flower-like structure; pappus absent.

Leaves alternate.

CAMPANULACEAE

Leaves opposite or whorled.

Plant a herb; ovary with 2 chambers; leaves whorled.

RUBIACEAE

Plant a shrub; leaves all opposite; fruit fleshy and berry-like with 3-5 chambers.

CAPRIFOLIACEAE

Endnote

The author is currently working on keys to all the species in the park, which should be available within the next year. As the preceding family key is part of a larger project dealing with the natural history of the park, I would be very pleased to receive any input as to how the key can be made easier to use.

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Loran L. Goulden Award (continued from page 1)

establish the Backyards for Wildlife and Habitat Steward programs, and was actively involved in many conservation projects. She has been the May Species Count and Christmas Bird Count coordinator since 1987. Myrna also has been co-editor of the newsletter since 1988, tirelessly typing and doing the layout of the newsletter, using a desk-top publishing program on her computer. She also donates her computer equipment and time in support of the Medicine Rivcer Wildlife Rehabilitation Centre. Myrna is an avid photographer, writes a monthly column in the Sylvan Lake News and is the author of Backyards for Wildlife and the best-selling Winter Bird Feeding - An Alberta Guide. She is currently working on a third book - Nestboxes for Prairie Birds. Myrna has long had a special interest in environmental education; she designed and delivered school programs while working as an interpretive naturalist at the Kerry Wood Nature Centre and has founded the successful Nestbox Program sponsored by Ellis Bird Farm Ltd. This program is designed for presentation to rural Alberta school students and complements the grades 5 and 6 science curricula. Over 3,000 rural Alberta students have benefitted from this program on nestbox trails and habitat preservation. Myrna has the rare talent of igniting wonder in even the most jaded of students. Myrna has served on the Board of Directors of the North American Bluebird Society since 1989 and is known internationally for her work with bluebirds. She has made important contributions, through her work as the biologist at Ellis Bird Farm Ltd., to the understanding of the population dynamics and characteristics of the mountain bluebird. Everyone who has the pleasure of working with Myrna benefits from her vitality, intelligence, humor and patience. She is one of those rare people about whom it is difficult to say a critical word. Myrna is the second RDRN board member to receive this award in the past ten years. Former board member Fred Schutz was similarly honored in 1984. Congratulations Myrna on a well-deserved honor!

(Reprinted from the Central Alberta Naturalist)

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South of the 50th Parallel
Naturalist Hot Spots in Southern Alberta

Elizabeth Savoy

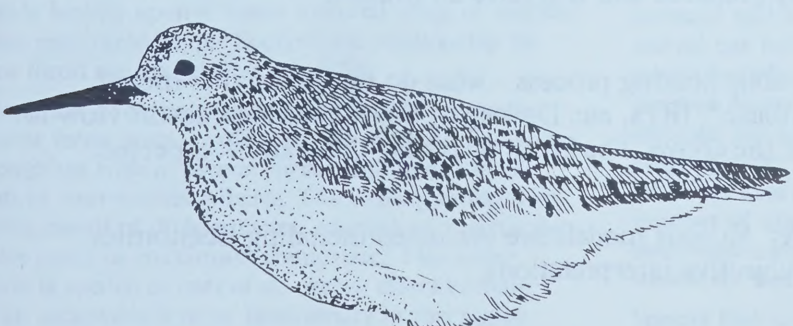
Are you planning a trip to southern Alberta this year? Most Albertans are familiar with major tourist destinations -- Waterton Lakes National Park, Writing-on-Stone, Dinosaur Provincial Park and the Cypress Hills, but there are numerous other "Naturalist Hot Spots" that are well worth visiting. Although this is by no means an exhaustive list, here are a few suggestions.

If you are travelling to Writing-on-Stone Provincial Park or the USA along Highway 4, be sure to stop and check out two wetland complexes -- Stirling Lake (north of Stirling) and Tyrell/Rush Lakes (southeast of New Dayton). Both are excellent sites for observing staging and breeding waterfowl and shorebirds and in recent years have yielded pleasant surprises for birders such as black-necked stilt, garganey and Eurasian wigeon.

While you are in the vicinity, make a quick detour to the Milk River Ridge. This east-west unglaciated ridge has limited public access, but there are a number of roads (mostly gravel) that make an enjoyable drive. The lush grasslands on the ridge support a multitude of wildflowers, including the rare Cusick's paintbrush *(Castilleja cusickii)*. The ridge is also a good place to spot interesting mammals and birds, such as the thirteen-lined ground squirrel, white-tailed prairie hare, Baird's sparrow and ferruginous hawk.

Not far from Waterton Lakes National Park, Police Outpost Provincial Park and the adjacent Outpost Wetlands Natural Area are rich in wildlife and plants. In late May and June, the wetlands are alive with birds such as the sora, bittern, great blue heron and even the occasional nesting sandhill crane.

Keho Lake, just north of Nobelford on Highway 23,is a large reservoir which has marshes developing along the south and eastern shores. It's a good spot for waterfowl and shorebirds during migration and in recent years its shores have supported nesting piping plovers.



The extensive cottonwood forests found along the Oldman River Valley are easily accessible to the public in Lethbridge, Taber (Provincial Park) and Fort Macleod. Along this river, three riparian poplar species are found -- plains cottonwood, narrowleaf cottonwood and balsam poplar. These forests are a "birder's paradise" where many species of songbirds are concentrated during migration and the breeding season. White-tailed deer, porcupines, raccoons and red foxes are just a few of the mammal species found here.

In Lethbridge, the arid coulees are home to both the prickly pear and pincushion cactus, as well as prairie rattlesnakes and black-widow spiders. Several yellow-bellied marmot colonies exist right within the city limits. The Helen Schuler Coulee Centre offers natural history exhibits, programs and information.

In southwestern Alberta, a drive and hike through the Porcupine Hills is a must. Highway 520 west of Claresholm will take you in to the hills and to the Skyline Trail which runs north-south along the top of the hills. Winding through limber pine, Douglas fir, aspen woodlands and flower-filled meadows, this gravel road yields exceptional views of the prairies and mountains. In June the flowers are outstanding -- including western wood lily, masses of forget-me-nots, shooting stars, balsam-root and orchids such as the calypso and striped coral-root. In spring and fall, the hills are a rewarding place to look for migrating raptors and songbirds. With careful searching, leopard and wood frogs can be found along the creeks and in beaver ponds. Mammals include elk, Columbian ground squirrels, black bears and wolves.

If you are in southeastern Alberta, a trip to the grasslands south of the Cypress Hills will give you a real taste of the prairies. Badgers, burrowing owls, pronghorn, loggerhead shrikes, sage grouse and grasshopper sparrows are just a few of the prairie species that can be seen from driving the gravel roads around highways 501, 502 and 41. In summer, be sure to get an early start for this driving trip -- it can get very hot and the best time to look for grasslands wildlife is between 5:00 and 9:00 am! For the more adventurous, Kennedy Coulee Ecological Reserve and Milk River Natural Area (about 3 hours from Lethbridge and 2.5 from Medicine Hat) offer a chance to hike through spectacular grasslands and badlands.

This is just a small sampling of some of the "naturalist hot spots" south of the 50th parallel in southern Alberta. There are many other exciting wildlife viewing opportunities in this part of the province. Check out the *Alberta Wildlife Viewing Guide* or contact the Helen Schuler Coulee Centre in Lethbridge (320-3064) for more possibilities. Both the Grasslands Naturalists Society (Medicine Hat) and the Lethbridge Naturalists Society run field trips to sites such as these on a regular basis.

Author's Address: Box 59, Monarch, Alberta T0L 1M0

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How to Value a Natural Resource: Various models are evaluated including Economics. How to tell hard facts from very subjective interpretations.

Simulation: Hands on, or workshop participant involvement, in a simulated mediation process. A hearing process can be substituted.

To set up a workshop please contact either the F.A.N. Office at 453-8629 or Maryhelen Posey, Calgary, phone 241-0530.

Forest Age and the Abundance of Songbirds

Dan Farr

Photos by Dan Farr

Introduction

The variable nature of Alberta's forest ecosystems stems largely from the influence of past disturbances. Prior to 1900, forest fire was the chief disturbance, but timber harvesting is playing an increasing role throughout much of the province. While the ecological effects of fire and logging are not identical, they combine to produce forested landscapes that are mosaics, with adjacent areas differing in the time since the most recent fire or logging. Areas of different ages often exhibit profound differences in vegetation structure and composition, and in the type of animal communities present.

The issue of how biological communities vary among different-aged forest stands is an important one. Forest landscapes managed primarily for fibre production (in Alberta, Forest Management areas) currently have a greater proportion of young stands than they did prior to management, for two reasons: i) the older stands within a management unit are usually harvested first (Alberta Forest Service 1989); ii) the intended maximum time between successive harvests (around 100 years) is considerably less than the historic maximum time between successive fires (well over 100 years, depending on location). Clearly, if fibre production is the primary goal of forest management, old forest stands will become a scarce commodity.

If other forest "products" such as wildlife are desired, then alternative forestry planning and management strategies are required. The success of these strategies depends heavily upon a better understanding of wildlife habitat requirements, particularly the relationship between forest age and habitat suitability.

As part of a larger project studying the habitat preferences of forest birds, I estimated the relative abundance of songbirds within several spruce-dominated forest stands in west-central Alberta. The basic question was: among stands of different ages, where does a particular species reach its maximum abundance? This information is needed as part of an overall effort to maintain an acceptable level of biodiversity in this region (Bonar et al. 1990).

Methods

Research took place within Weldwood's Hinton Forest Management Agreement (FMS) area, roughly 53° 30' N, 117° 00' W. The study sites were within the Upper Boreal Coniferous and Subalpine ecoregions described by Corns and Annas (1986), and all were within 20 kilometres south of Hinton. I examined nine sites, divided equally into three age classes: young (logged 35 years ago), mature (around 100 years post-fire) and old (over 180 years post-fire). Each site was just over a square kilometre in size, and most were dominated by spruce (mostly white spruce, some black spruce), with varying proportions of lodgepole pine, subalpine fir, and trembling aspen.

Northern Three-toed Woodpecker

Bird abundance was estimated using the variable-radius circular plot method of Reynolds et al. (1980). Each of the nine sites contained 12 monitoring stations located 300 metres apart, and each site was visited four times between mid-May and mid-July, 1991. Monitoring started one half-hour before sunrise, and ended approximately four hours later. At each station, I counted the number of individuals of each species detected (seen or heard) during a 10-minute period. Singing males were assumed to represent a mated pair, therefore total counts were based on either twice the number of singing males, or the number of all detections combined (songs, calls, and visuals), whichever was greater (Reynolds et al. 1980).

Species that sing loudly (e.g. Swainson's thrush) could be detected over a much greater distance than quiet species (e.g. golden-crowned kinglet), and thus the effective sampling area varied considerably among species. The appropriate sampling area for each species was used to convert total counts to estimates of density (birds per square kilometre) at each of the 108 stations. Interested readers should consult Ramsey and Scott (1979), Reynolds et al. (1980), or Ralph and Scott (1981) for further details.

Results

Of the 42 bird species observed during this study, 22 were detected frequently enough to estimate their population densities. Over 80% of the 4216 detections were of singing males. Visual observations were relatively rare.

The relationship between stand age and bird density varied considerably, with some species reaching their peak densities in young sites (e.g. orange-crowned warbler, Fig. 1a), others in old sites (e.g. winter wren, Fig. 1b), and still others showing no clear relationship to stand age (e.g. boreal chickadee, Fig. 1c). Pairwise Student's t-tests were used to clarify differences in mean density among the three age classes; Table 1 summarizes the results.

Discussion

The variable-radius circular plot technique allows for the comparison of a single species' abundance among locations, thereby illuminating patterns of habitat use. Comparisons among different species are more difficult because of the potential error involved in estimating the effective sampling area for each species (see Methods, above). If sampling area is underestimated for a given species, then density will be overestimated, and vice versa. Thus the technique is most suited for studies in which comparisons are limited to different locations within a single species.

In this study, differences in bird communities among different-aged sites are probably associated with successional changes in vegetation structure and composition (Stiles 1980). The young sites had considerably more deciduous trees (aspen), while old sites had higher densities of standing dead trees and a larger volume of leaves in the canopy. Differences in the structure and composition of understory vegetation and in the abundance of fallen logs (Conner et al. 1983) may also be important. Finally, physical attributes not influenced by succession may play a role (e.g. stream corridors, elevation, aspect). Work is in progress to assess the relative importance of each of these factors.

The differences associated with forest age imply that for most species, the habitat suitability of a given location changes through time. Young forests that currently offer excellent habitat for orange-crowned warblers will decline in suitability as they mature. Conversely, an old forest containing a high density of winter wrens will probably contain none immediately after a catastrophic disturbance (fire or clearcutting). For populations of songbirds and other species, habitat suitability is constantly shifting, and no single location can be expected to provide adequate habitat forever.

The dynamic nature of forest landscapes and the resulting patterns of habitat suitability suggest that a long-term perspective is necessary if the conservation of biodiversity is to be a goal of forest management. Of immediate concern, in view of their declining proportion, is the role of old forests in sustaining populations of certain species. Alberta currently has no old-growth management policy, although the province has recently committed itself to developing one (Alberta Forestry, Lands and Wildlife, 1991). Clearly, such a policy must fit within a broader framework of reserves and harvest

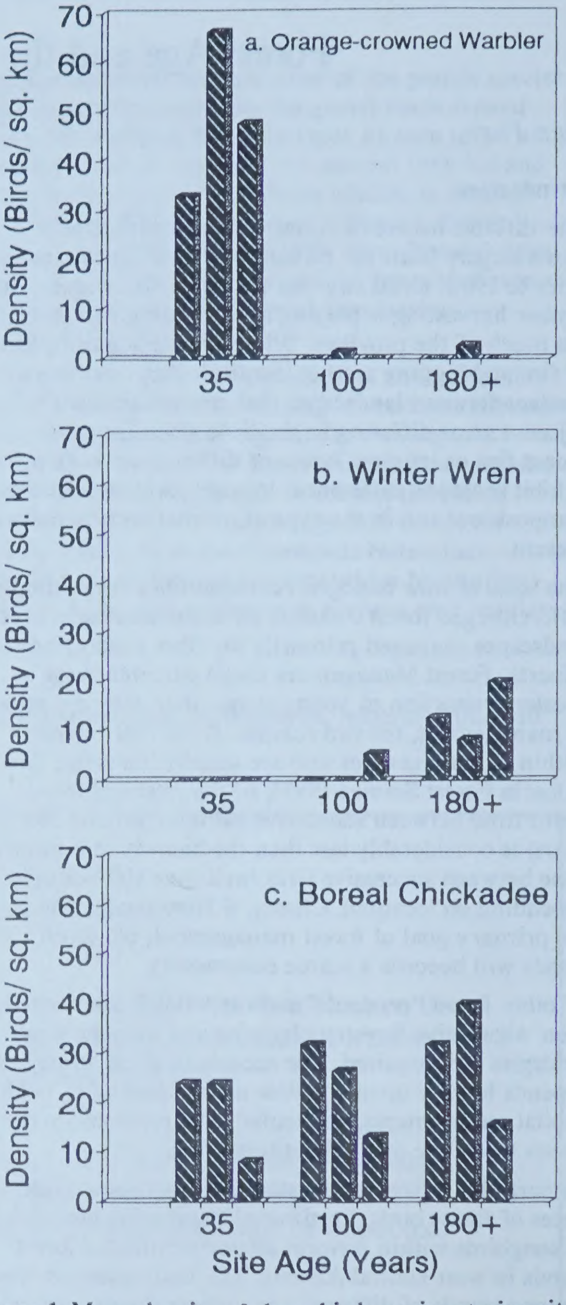


Figure 1. Mean density of three bird species at nine sites near Hinton. Sample size = 12 stations per site.

Table 1. Patterns of bird abundance compared among three forest age classes near Hinton.

Species reaching their highest abundance in:

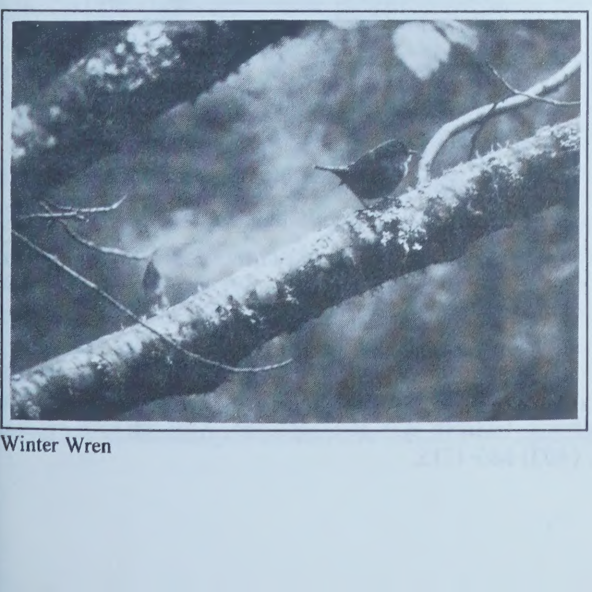
Young Sites:
- Hermit Thrush
- American Robin
- Warbling Vireo
- Orange-crowned Warbler
- Wilson's Warbler
- White-throated Sparrow
- Chipping Sparrow
- Dark-eyed Junco

Young or Mature Sites:
- Yellow-bellied Flycatcher
- Ruby-crowned Kinglet
- Swainson's Thrush

Mature or Old Sites:
- Golden-crowned Kinglet
- Varied Thrush
- White-winged Crossbill

Old Sites:
- Three-toed Woodpecker
- Red-breasted Nuthatch
- Brown Creeper
- Winter Wren
- Pine Gosbeak

No Difference
- Gray Jay
- Boreal Chickadee
- Yellow-rumped Warbler



Winter Wren

schedules that perpetuates a mosaic of ages. Simply establishing old-growth reserves will fail unless younger forests are intended to replace them following inevitable catastropic disturbances such as fires. A long-term landscape perspective of forestry planning and management is essential if present levels of biodiversity are to be maintained.

Warbling Vireo

Acknowledgements

This research project is supported by several organizations, and the financial or logistical support of the following is gratefully acknowledged: Alberta Forestry, Lands and Wildlife (Fish and Wildlife Division, Forest Technology School); Canadian Circumpolar Institute of the University of Alberta; Canadian Wildlife Service; Department of Forest Science of the University of Alberta; Recreation, Parks and Wildlife Foundation; and Weldwood of Canada Limited (Hinton Division). Laurie Hunt and Rob Stewart reviewed this manuscript with critical eyes.

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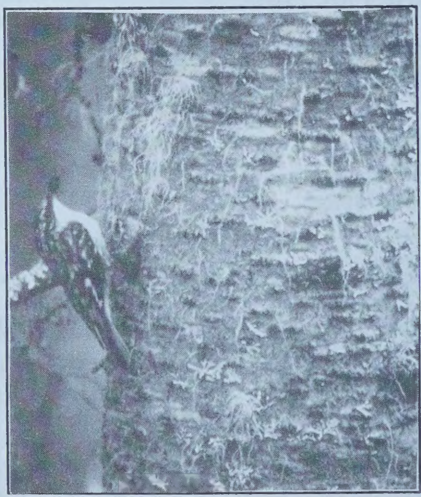
Field Research Assistants are needed to conduct songbird surveys in the Hinton-Edson region from May to July 1982. For further information please contact Dan Farr at the address below.



Brown Creeper

Author's Address: Box 5011, Hinton, Alberta T7V 1X3: ph. (403) 865-1215.

Seeing May Be Believing, But Sometimes It's Not! Commentary On Alberta's Bird Species List

Dave Ealey

This is just a short note to solicit additional comments about the Alberta bird species list. To date, despite an unfortunate error with my address in the issue that ran the "Birds of Alberta Species List" (Ealey 1991), I have received comments verbally and in writing from several birders regarding species missed, disagreements on status and suggestions for improvement. I want to thank Wayne Smith, John Steeves, Mike O'Shea, John McFaul, Cleve Wershler and Doug Collister for their comments. I intend to respond to these and others with a revised, annotated list by the summer.

It is clear from comments received that a more precise, and more rigorous, set of criteria are needed to guide inclusion of bird species in the Alberta list. My original purpose in producing a list was to accompany a bibliography of Alberta birds (Ealey and McNicholl 1991), so the list should have included all species associated with Alberta in the literature. I missed including tricoloured heron and lesser black-backed gull, but otherwise my list seems to have been complete.

Some problems arise when taxonomy and nomenclature change, and certain species are lumped or split -- red-breasted sapsucker is a species that should have been included in the list, because it is now considered a separate species. Most of the remaining criticism has related to what should be on the hypothetical list and what constitutes sufficient substantiation to allow a species to be listed on the official checklist for the province. Hence, my title above -- simply seeing a bird constitutes one level of documentation, but for the provincial list there should be more rigorous guidelines.

Therefore, I am proposing to use the criteria employed by the former Alberta Ornithological Records Committee, and will prepare a list that includes only fully substantiated records and supplementary lists of "hypothetical" species with different degrees of documentation. The following list explains these for those who are unfamiliar with the AORC criteria.

Regular Checklist Species

Category I - Substantiated Records

A submission accompanied by full data (place, date, observer, weather, etc.) and one or more of the following: a specimen, a fragment from which the species can be identified beyond doubt, a photograph clearly showing identifying features of the species, an electronic recording of the songs, calls or other sounds which are sufficiently distinctive to identify the species.

Hypothetical Species

Category II - Documented Observation

A submission which includes a written description of the bird made at the time of observation which leaves no doubt as to the identity of the bird. The description would be in the form of the original pages of the observer's field notebook or photostat copy thereof. Supporting evidence in the form of sketches, tape recording, etc. may also be submitted.

Category III - Documented Nesting Record

A written description made at the location of the nest, its site, its contents and the attendant birds, which leaves no doubt as to its identity. Supporting evidence in the form of sketches, etc., may also be submitted.

Category IV - Unsubstantiated Record

A submission which does not fully meet any of the above standards.

I would like to get any further comments on the list in its present form as soon as possible, as well as comments on my proposed approach to an official list. My correct address is 3903 - 105 Street, Edmonton, T6J 2K7. I can be reached at 422-0858 (work) or 434-0841 (home). I look forward to comments.

Letter to the Editor

I observed Columbian ground squirrels 60 km south of Jasper near the Sunwapta Warden Station in Jasper National Park. A segment of the local population is entirely black intermingled with normally coloured individuals. I have found no mention of this colouration in any of my reference materials. Should you be aware of anyone studying Columbian ground squirrels that may be interested in this unusual population -- I would be happy to provide further information and a detailed location. I believe there to be about six, jet black, individuals, and that they have been in the area for some time.

Andrew Whittiuk, Box 1950, Jasper, Alberta T0E 1E0

The Bird Atlas Project

The Atlas of Breeding Birds of Alberta will be available to the public on October 28,1992. It has been a long time coming but the end is in sight. Five years of field work and the efforts of several hundred volunteers will finally be tied together

The last data cards have now been reviewed so that the maps for those species that have been confirmed as breeders in Alberta can be finalized. Over 120,000 data entries have been processed to achieve the final maps. Production of these colour maps will begin in early May. The distribution of the individual species will be overlayed on the natural regions of the province, visually demonstrating the influence of habitat on distribution.

With the generous contributions of several Alberta photographers, the Atlas will have the finest collection of colour photographs representing Alberta's breeding birds. The majority of the photos will show the bird at its nest. This factor alone will make the book an attractive addition to any collection.

The text is nearly completed and in addition to the species accounts will include a history of ornithology in Alberta, a description of the natural regions of the province, a methodology and an extensive bibliography. There will also be appendices listing common migrants and other interesting subjects.

The Federation of Alberta Naturalists wants to extend to all its supporters an invitation to take advantage of a pre-publication discount. The retail price of this hard cover copy of the Atlas will be $45.00, however if ordered prior to August 1, 1992 the following coupon outlines an excellent opportunity to save money. FAN will accept cheques, money orders or VISA orders. Please order early to take advantage of this discount.

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Book Reviews

Plantwise

Pamela M. Hickman. Federation of Ontario Naturalists. Kids Can Press Ltd. Toronto, Ontario, 1991. 96 pages. B & W illustrations.

You can walk into any bookstore and find numerous books on gardening and even entire volumes devoted to a single plant. However, it has been very difficult to find good books about plants at a level a child can understand. This new book goes a long way to redress this omission.

Explaining the complexities of the plant world to an audience at the grade 4 - 6 level can indeed be a challenge. Topics including plant adaptation and classification are not usually considered in the school curriculum until Grade 10. Pamela Hickman has managed to simplify complex topics yet not leave out the important parts. Concepts such as plant physiology and structural adaptations are explained by example and reinforced with clear, simple illustrations. The step-by-step experiments are well organized and most can be done without much adult supervision. Hickman shows how plants are important to us in our daily lives, then makes a pitch for conservation of endangered species.

Despite being one of the better books I have seen on this topic, there are some failings. Western Canadian children may have some trouble with the examples of plants used, as many are not found on the prairies. Some of the vocabulary may be a little beyond the grasp of elementary school students, and not all of the technical terms are defined when they are first encountered. This can cause confusion when read by children, particularly if isolated sections are used as a teaching tool. Most experiments are simple but may take several hours or even days - fine for the child at home or with longer term school projects, but less useful to an interpreter trying to borrow a few ideas for an hour long program. I realize that the book is intended for a child's use, but it would have been nice to have a few bones tossed our way.

Yes, these are quibbles with an otherwise fine children's book. And with a dearth of alternatives, I certainly intend to add this one to the Muttart Conservatory's library.

Brent Bouvier

Prairie Oasis: Kinbrook Marsh

Clive A. Schaupmeyer. 1991. 8 pp. $4.50.

Southeastern Alberta is one of the better wildlife-watching areas in the country because of places like Lake Newell's Kinbrook Marsh, near the town of Brooks. For all naturalists, the area, with its "profusion of birds, mammals and plants," is well worth visiting.

Clive Schaupmeyer's booklet, Prairie Oasis: Kinbrook Marsh is essentially an expanded photo brochure (with no map!). Unfortunately, over half of it is dedicated to Canada geese. Only three other birds species are shown, a small percentage of the actual number that use the area. The brochure style may be Schaupmeyers's intent, and the booklet would make a nice souvenir for tourists. But naturalists would long for more. A few less shots of geese and more examples of "the diverse plant and animal life of Kinbook Marsh and the bordering prairie" would have been in order. Other than as a souvenir, it's a book to glance through, not to buy. But do go see the marsh!

Dennis Baresco

Be it a mountain meadow, an aspen woodland or a prairie coulee, we all have a favourite "naturalizing" spot that we return to again and again. For Clive Schaupmeyer, it is the Kinbrook Marsh.

This talented photographer has captured a view of the marsh known only to the dedicated few who rise early in the morning to capture on film the intimate scenes of nesting waterfowl.

The Kinbrook Marsh is a highly productive wetland off Lake Newell near Brooks. Canada geese, teal, coots and many different species of ducks nest in the cattails or in the brush near shore. By no means exhaustive, nor intended to be so, this booklet has succeeded in capturing the colour of this birder's paradise.

Anna Robertson

Bibliography of the Family Catostomidae (Cypriniformes)

John Clay Bruner. 1991. Natural History Occasional Paper No.14. Provincial Museum of Alberta. 213 pp. $9.95 soft cover.

Bibliography of the Family Catostomidae (Cypriniformes) by John Clay Bruner is the product of months of toil and provides readers with a thorough introduction to the rich literature regarding suckers and their relatives. Dr. Ed Crossman of the Royal Ontario Museum rightly points out in support of bibliographies that they represent a godsend for people starting to work with a species or group of related species. Users of a bibliography benefit from the time invested by its author(s) in acquiring references which might not otherwise be available to others. For people interested in obtaining information regarding catostomid fishes this is clearly a good place to look first.

Over 2000 references are provided and include those regarding fossil as well as recent species. Information for each species is listed according to subspecies (where indicated by the author of a paper) so that a user can obtain information on a particular race or form. Papers on hybrids are also included. Entries date back to 1773 when the first scientific paper on a catostomid fish was published. References are included up to those listed in the Zoological Record Vol. 126, 1990, permitting those seeking more recent information to search subsequent issues without unnecessary duplication of effort.

Naturalists, students, teachers, conservationists, anglers and biologists can all benefit from John Bruner's thorough efforts to accumulate references regarding this interesting and important family of fishes.

Wayne Roberts

Aquatic Invertebrates of Alberta

Hugh F. Clifford. 1991. The University of Alberta Press. Edmonton, Alberta. 550 pp. $70.00 soft cover, $82.00 hard cover.

Dr. Hugh Clifford has made a career of introducing university students to the rich diversity of invertebrates, particularly those that occur in the fresh waters of Alberta. The fruits of years of gathering information by Dr. Clifford, his students and other researchers are made available in this much needed illustrated guide to aquatic invertebrates found in Alberta. Dr. Clifford, an award-winning educator, has used his teaching skills to present a wealth of information in user friendly form. The reader is introduced to the book in a brief introductory chapter which provides a guide to its contents and organization.

General methods for collection, preservation, preparation and storage of specimens are discussed in Chapter 2. A brief introduction to classification is provided for the non-specialist. Instructions for use of the identification keys are provided, including a discussion of their limitations as well as a thoughtful and informative discussion regarding the difficulties involved with identifying such as diverse and not always well understood assemblage of organisms.

The main body of the book consists of forty chapters dealing with invertebrates from Sponges to Insects. Each chapter contains an introduction to the taxonomic group discussed, a description of the general features and biology of the organisms. Specific information regarding prepared pictorial keys provide a means of identifying organisms (to species in some cases, or to genus in others). A list of species found in Alberta is included for some groups as well as a list of those that might also occur here but have not been reported. A survey of references for the invertebrates discussed in each chapter provides the reader with more specific information based on studies of populations within Alberta. There is a list of general references to Alberta's planktonic and bottom-dwelling invertebrates at the end of chapter three.

Besides the 133 pictorial keys the book is generously illustrated with 203 color photographs, seven black and white photographs, 115 whole specimen drawings and 32 figures. A glossary clearly defines the terminology in the text and pictorial keys.

The references cited section is followed by a further list of references dealing with the biology of aquatic invertebrates of Alberta. An index of common and scientific names of organisms and the groups to which they belong concludes the book.

This guide does not include the adults of insects such as mayflies and stoneflies (of interest to the angler) however these are dealt with extensively elsewhere and since it is the aquatic stages that form the bulk of the insects eaten by fish anglers will find this book invaluable. This is a well written and easy to use book and will be a valuable guide for a broad range of users from children to professional biologists. This book is 550 pages of thoughtfully presented information and a bargain at $70.00.

Wayne Roberts

Wanted: May Species Count Coordinator for birds for the province.

Duties:

1. Compile data for the various bird counts across the province. Computer spread sheet knowledge desirable but not essential.
2. Write an accompanying article for the Alberta Naturalist, giving interesting sightings and analyzing trends in birds sighted.

This is an interesting challenge for anyone interested in birds. Our previous compiler, Ross Dickson, has resigned after two years in the position. However, he is willing to assist anyone in getting started. Phone him at 282-0440, Calgary.

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CONTENTS

President's Page 1

Naturalist Hotspots Around Edmonton, Joy and Cam Finlay 2

Why Doesn't It Look Like the One in the Book?, Wayne Roberts 4

Common Raven Nesting in Edmonton, Ernie Kuyt 6

Great Gray Displaces a Great Horned Owl on Nest, W.H. Hoffmann 8

Pine Martens Stalk Snowshoe Hare, D. Johnson 9

Update on the Butterflies of Redwater Sand Dunes, Norbert G. Kondla 10

Hummingbirds in Cadomin, Marlene Reich 18

Book Reviews 19

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.

May Species Count for Birds and Mammals; July 15, FAN, Box 1472, Edmonton, AB T5J 2N5.

May Species Count-Plants; July 15, J. Derek Johnson, Northern Forestry Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Patron: Hon. Dr. J.W. Grant MacEwan

The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research, and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropreiate actions.

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Red Deer River Naturalists, Box 785, Red Deer, AB T4N 5H2.
Vermilion River Naturalists, Box 1769, Vermilion, AB T0B 4M0.

Associate Member: Beaverhill Bird Observatory, Box 4201, Edmonton, AB T6E 4T2.

President's Page

R. Barry Jenkins

I hope you are having a good summer; it looks like mine will be spent indoors at meetings. We had a FAN meeting in Lethbridge on May 23. Half a day was spent looking at what the Federation is doing and whether or not what we are doing are things which we should be doing. With our limited resources (mainly volunteer time) we cannot do everything, but we did basically decide that although our primary purpose is not advocacy it is important to us as a group to have a voice in the major issues facing wilderness and the environment. The member clubs will of course be the main voice in the areas where they are located, but FAN will provide as much support as possible. FAN will continue to be an intervener (organization or an individual other than a developer that may or may not support the development) in NRCB and ERCB hearings when these have major impacts. FAN will also support local groups who are acting as interveners.

I spent the weekend of June 13/14 at the annual meeting of the Alberta Environment Network. If you have not heard of this group it is just what its name says, it is a networking organization made up of over 200 environment related organizations in the province, everyone from the Alberta Fish and Game Association to the Banff Recyclers. The Network seems to be getting back on track after several years of often bitter internal disputes as to the degree of advocacy the Network should do. By its nature the Network cannot be an advocate of any position; it cannot possibly speak for its many and varied members but some organizations felt that without a voice the Network was useless. It was a good weekend where I met a number of new people and organizations, and renewed aquintances with a number of others I had not seen for some time. This meeting is probably the only forum where groups such as the ''Friends of the North'' and the ''Friends of the Old Man'' meet and exchange information, and phone numbers.

I hope you can get outdoors and enjoy the summer; if not, enjoy what you have to do instead.

What Do You Think?

From the Editor

The Alberta Naturalist has put on a new face - what do you think?

Just like a person, a publication has a life. It begins brand-spanking new, the brainchild of an editor or a committee. The first few issues are fraught with late nights, anxiety and insecurity. Will it work? Will the readers like it? As the publication matures, the production becomes easier: articles come unsolicited, researchers and FAN members use the publication to let others know of their findings and sightings and new people join the organization so that they can receive the publication.

The publication grows and develops, sailing steadily through adulthood. But then, something happens. Perhaps it's changing interests on the part of the readers or the publication has become too familiar. The publication begins to look its age.

The Alberta Naturalist had its mid-life crisis recently. We decided that drastic cosmetic surgery was in order. But more than just a face lift and a tuck here and there, the new Alberta Naturalist also has made a commitment to soliciting and publishing articles on a wider range of subjects to interest a wider readership. We will still carry articles on research taking place in Alberta, but this will be balanced with articles on nature-watching opportunities, and readers' own sightings and experiences.

Please let us know what you think of our new format. If you have any ideas for articles or would like to write an article, we would love to hear from you.

Another change you will see in an up-coming issue is the appointment of a new editor. In order to devote more time to business commitments and family, I will be leaving the Alberta Naturalist at the end of the year. We are now looking for someone who is interested in taking over the editorial duties. If you feel that you may be interested, please give me a call at 342-6889 or the FAN office at 453-8629. The position is both a challenging and a rewarding one.

Naturalist Hotspots Around Edmonton

Joy and Cam Finlay

Many exciting sites are in the Edmonton area. We include but a few to whet your appetite for exploring.

East of the City

1. Beaverhill Lake is probably the best known spot in the region for waterbirds. In April, vast hordes of geese arrive, beginning with Canadas, then white-fronts followed by snow geese. Tundra swans come near the end of the month into early May. Ducks arrive at the same time; pintails first, followed by mallards, common goldeneyes and then the other prairie puddle ducks. By early May, up to 15 species of ducks may be seen in one day. In mid-May, shorebird numbers and variety increase, peaking in the third week then tapering off by early June.

Two or three peregrine falcons can usually be found when shorebirds are around in numbers. Rough-legged hawks begin showing up in April. Then red-tailed hawks appear. At this time, snowy owls pass through as they head back north. It is common to find up to half a dozen species of birds of prey on a day's outing in early May.

Non, or failed, breeding adult shorebirds start returning south in the second week of July, peaking in late July and early August. By this time waterfowl are again flying in, continuing to build up around the feeding station on the south shore by mid to late September.

Bald eagles start appearing in late September-early October to feed on hunter-injured ducks. Eagles and ducks stay around as late as December until the lake is frozen.

To find Beaverhill Lake, go east of Edmonton on Highway 14 to Tofield. Enter this town and turn right immediately after crossing the tracks. Drive east as far as you can and leave the car to walk north and east for about two kilometres to the shoreline. The weir at the south east corner is a good spot.

2. Elk Island National Park: Stands of spruce, mixed balsam and aspen poplar woodlands and black spruce bogs on the north side of the park, plus many small beaver ponds, Astotin Lake with its fish, and open meadows, attract a wide variety of birds including pelicans, double crested cormorants, trumpeter swans and many woodland species. By late June of 1992 Bob Carroll, (998-0082) of Birdwood Bed and Breakfast, had found 169 species in the park including nesting boreal, barred and great gray owls.

Over 600 bison, both plains and wood, numerous coyotes, elk and moose all add to the attraction of the park. Vegetation is a wide mix of aspen parkland, northern forest and some prairie species.

Several well laid out trails are available year-round for walking in summer and groomed for cross-country skiing in the winter.

The park lies within an hour's drive east of Edmonton on Highway 16. The best time for seeing birds and mammals is early morning.

3. Antler Lake Sewage Lagoon: Here is a great spot to find 8 to 10 species of ducks and several shorebird species, including avocet and Wilson's phalarope, from late May through June. The last shorebirds to leave on their way north are often found here, too. In spring, waterbirds come here first as this is often the only open water. Again in fall they stay around when other water bodies are freezing over. Both waterfowl and shorebirds also like the lagoon because of the richness of food supplies. This site is on the west side of the road across from the Waskehegan Staging area of the Blackfoot Grazing Reserve, about 8 km south of Highway 16 on the west side of Elk Island National Park. The lagoon is hidden from the road by a raised pile of dirt.

4. Sherwood Park Natural Area: These woods are a favorite site of Edmonton birdwatchers for finding woodland birds at all times of the year, and to enjoy a cross section of aspen parkland vegetation from May through September. Woodland mushrooms are particularily abundant in late June and after a heavy rain. A pair of horned owls nests here every year and at least two pairs of saw-whet owls are found each spring. A herd of white-tailed deer are fed daily by a local farmer and, as a result, there are numerous deer and coyote trails cutting across this natural area.

To reach the site take the Sherwood Park Freeway/Wye Road east of Sherwood Park to the traffic light at Rge Rd. 231. Turn south on 231 for 4.4 km to a small parking lot on the west side of the road. The 2.6 km circular trail takes about an hour and a half to explore or a half hour to hike.

Within Edmonton

1. North Hermitage Park: The ponds in the north end of this city park are close to the river and host a variety of water birds including gulls and terns. These ponds are one of the better water birding spots within the city. Fairly tame beaver have a large house here as do muskrats. Small fish are very numerous providing food for a variety of fish-eating birds including terns and a great blue heron.

Woodlands on the river bank are full of bird life as they move through on migration or, at the appropriate time, make their nests. A pair of red-tailed hawks raise young here each summer.

On the bank above the flats there are some of the largest pincherry trees we have ever seen.

To reach the park take the Yellowhead Highway 16 to the east side of Edmonton and turn north on Victoria Trail to the first east, or right, exit to Hermitage Road. Follow Hermitage Road east down into the park. In the park, at the junction, take the left road north to the small parking lot at the green gate where you leave your car. Walk north to the large pond. Check it out and then continue north exploring the woods on the river side and the opposite hill side for birds and vegetation.

2. Emily Murphy - Hawrelak Parks: Emily Murphy Park is one of the City's early parks. Hawrelak Park, formerly Mayfair, is a redeveloped series of gravel pits. These riverside park areas provide opportunities to find riverine vegetation and birds within a short walking distance of downtown and the University. Ponds and a protected island for waterfowl nesting in Hawrelak Park attract several waterbirds usually not found in an urban centre. Sandbars and channels off Emily Murphy Park are used as loafing sites for gulls and waterfowl in spring, summer and fall. Some people pan for gold on these sandbars, too.

The mix of vegetation along the river bank, together with the upper bank east of Emily Murphy Park are good places to find a mix of wild flowers in bloom from early June onward. An early morning or late afternoon walk followed by a picnic at the tables set among the trees is a good way to spend a half day of exploring nature in a city.

Coming from the north side of the river take the Groat Bridge and turn off west into Hawrelak Park or east into Emily Murphy Park. The parks are also accessed from the University by proceeding down the hill off Saskatchewan Drive. Alternatively, take the main road north towards the Groat Bridge but turn off at the University exit and go east to Emily Murphy Park or west into Hawrelak Park. These parks are joined by a good footpath on the river terrace along the south bank underneath Groat Bridge.

3. Whitemud/Rainbow Valley Parks System: This extensive ravine system of natural areas extends south from the North Saskatchewan River up Whitemud Ravine/Creek to the far south end of the city. It is used as a corridor by wildlife, both birds and mammals and presumably insects, too, to enter the city. A herd of white-tailed deer lives here year-round and coyotes and foxes have dens here. The only nest of barred owl in the city was located here and at least one pair of western tanagers can usually be located in May/June each year near the mouth of the ravine.

The ravine is also a good place for botanizing. The yellow lady slipper and wood lily have been seen in bloom here.

Cretaceous bedrock, of the same material that is found around Drumheller, out crops along the ravine in several spots. Fossil wood and small remnants of dinosaur bones have been found in the creek bed.

The mouth of Whitemud Creek is accessed from Fox Drive just east of the Quesnel Bridge. Go east over the Campbell Bridge and immediately turn north at the Keillor Road sign and then west onto the gravel road near the river. Follow the gravel road west, then south back under the Campbell Bridge to the parking lot.

Rainbow Valley Campground and Ski Hill and south Whitemud, halfway up the ravine system, is accessed from the Whitemud Freeway south on the 119th St. exit road for 0.2 km, then west at the Whitemud Park sign down the slope, under the bridge to the parking lot.

West of the City

1. Wagner Bog: A unique site in the area, the bog and calcareous fens contain at least 16 species of orchids plus numerous other plants. The marl area of fen is interspersed with a black spruce bog, aspen woods and an open meadow. This varied habitat ensures a variety of birds throughout the year. Late May, June and July are the best times to come for birds and flowers. Earlier in May frogs and toads may be heard. This is a special place to find boreal toads as they call, mate and lay eggs here each spring. In late fall and winter three-toed woodpeckers often occur with a good chance for a hawk-owl, too.

To find this spot, take Yellowhead Hwy 16X west from the city to 1.6 km west of Secondary Road 794 at the Atlin Road sign. Turn south for 30 metres and then east for 400 metres to the small parking lot. Walk south through the hole in the gate along a grassed trail and pick up a brochure from the pamphlet box. Continue along the self-guided trail.

2. Clifford E. Lee Nature Sanctuary: A series of boardwalks and wide trials make this a great place to see waterbirds and mammals from early spring breakup until the ponds freeze over in late fall. Several pairs of Canada geese fledge young from the site and a variety of ducks have broods here from June until they leave in the fall. Muskrat are commonly seen swimming and gathering food near the boardwalks that cross over the ponds. There is a stand of jack pine complete with an understory of bearberry on a higher sandy knoll. Good examples of open aspen woodlands and willow thickets are there,

too. We often take elderly visitors or couples with young children here since walking is very easy and wheelchairs and baby strollers may be used, too.

Take Hwy 60 from Devon north, or Hwy 16 south to the Woodbend Road. Go west on Woodbend for 1.6 km, then south for about a km to the sign for the sanctuary parking lot on the west side of the road.

3. Chickakoo Lake: To hear and see a common loon within an hour's drive of Edmonton, come to this spot of wilderness. The wide trial, groomed in winter for cross-country skiing, and signed with a self-guiding brochure for a summer walk make this a year round site to visit. Many kinds of plants make this a great place to come to botanize in June and July. Hip high false Solomon's seal can be found here.

To reach this "loon haven", turn north on Hwy 779 from Hwy 16 to 16X. Proceed north for 3.2 km then west for 4 km to the Chickakoo sign and go north for 3 km into the parking lot at the lake. The self-guiding brochure may be picked up under the large sign at the main parking lot.

Those wanting to locate other good places to visit should contact the Wildbird General Store and ask for Jack or Pat at 479-9833. They keep a list of bird sightings for the region and know what is new and where it can be found. Also try the John Janzen Nature Centre at 428-7900 or 428-3771 and ask for Gerry or the naturalist who can tell you good places to find other birds and flowers at the appropriate times. Both locations sell reference books and other natural history items.

Authors' Address:
Box 8644, Station "L", Edmonton, Alberta T6C 4J4.

Why Doesn't It Look Like the One in the Book?

Wayne Roberts

When you look at an animal either in hand at a distance or perhaps even in a picture you may be puzzled to find that it looks unlike anything you have seen before and perhaps different from any species illustrated in the field guides or books you rely on for identification. Frequently this problem arises because the species is only illustrated by a single individual or perhaps by a small series including an adult male, an adult female and an immature individual (showing sex and age differences) or perhaps by illustrations showing seasonal differences in appearance. If only a single illustration is used it is often an adult male in breeding condition as these often bear species specific structures such as the antlers of deer species or the bright species specific colours found in birds such as ducks or warblers. In all of these cases the assumption is made that the illustrations are of average or typical examples of the species. For many bird and mammal species such illustrations are generally adequate as aids for identifying examples of the species however this is not always true for many of our amphibians where a great deal of variation in colour and pattern occurs within many species. This often results in the misidentification of even our most common species.

The colour and pattern variation within the tiger salamander *(Ambystoma tigrinum)* is so great that in portions of the range of this species certain of the colour variants have been described as distinct subspecies. Within Alberta the occurrence of more than one race is questionable as the different forms may occur within the same breeding population (i.e. at the same pond). The tiger salamander is frequently illustrated in the form characterized by the bold black and yellow tiger--like stripes for which the species is named. Striped individuals are widespread in Alberta and frequently encountered however they represent a midpoint in the range of colour variation in this species where there is a nearly equal distribution of light (olive or yellow) and dark (melanin) pigment in addition to the extent of each colour the pigments are distributed in clearly defined stripes. At one end of this spectrum are individuals with very little melanin distributed on small scattered spots. Individuals with black spots are not abundant where they are found and striped or mottled individuals usually occur in greater abundance at the same sites. Tiger salamanders of this colour pattern found by the author in Central Alberta were all males. Owing to the small number of "black spotted" individuals found it is uncertain whether or not, in Alberta, this colour pattern is restricted to males. In southern Saskatchewan and Manitoba and in North Dakota populations of tiger salamanders (the Devil's Lake tiger salamander) are found in which most individuals of both sexes are black spotted (Dunn 1940). At the other end of the spectrum are salamanders with extensive black pigment surrounding islands of yellow pigment. Light spotted individuals have been found in the Edmonton area where they may be the common form at certain ponds. This colour pattern is characteristic of the

Eastern tiger salamander which is widespread in eastern North America south of Ontario.

Colour and pattern variation in salamanders and other amphibians is increased by their ability to lighten and darken their skin colour in response to temperature and background colour. Cold amphibians often appear dark as the black pigment melanin within specialized cells (melanophores) spreads throughout the cell enabling the skin to better absorb radiant energy from the sun which helps them raise the body temperature. When the melanin is dispersed the colours become darker and may appear almost black thus green or brown skin with black spots may become so dark that it appears to be uniformly black with no evidence of spotting. While the colour may lighten and darken within a matter of minutes, the colour and pattern of an individual amphibian's skin is constant throughout life shortly after transformation from the larval state. Thus striped individuals are always striped and spotted individuals are always spotted even though the markings may sometimes be temporarily obscured by darkening of the skin.

The Boreal chorus frog *(Pseudacris triseriata maculata)* is probably the most abundant amphibian in Alberta and also the most variable in colour. Its back and sides may be striped (stripes may be broken) or spotted. On some specimens the pattern is so faint that the frog appears to be a solid colour. The colours include green, gray, brown and reddish brown or combinations of these. The spots and stripes are often a darker shade of the body colour, for example dark brown stripes or spots on a light brown body. No attempt has been made to determine the distribution and abundance of different colour morphs in Alberta. In Colorado it was found that populations of chorus frogs in ponds separated by as little as 500 m differed (significantly) in the frequency of frogs of eight different colour combinations at each pond (Tordoff et al 1976). The differences between populations studied over a five year period remained the same throughout the study (Tordoff and Pettus, 1977). These differences may represent adaptations to small differences in local conditions.

The wood frog *(Rana sylvatica)* is the small to medium sized brownish frog that people in the parkland, foothills and boreal forest see most frequently. A light mid-dorsal stripe is found on about half of the wood frogs seen in Alberta. In a pooled sample of 420 wood frogs from various parts of Alberta I found there were 214 with and 206 without a mid-dorsal stripe. At any site where there is a large (30 or more individuals) sample the ratio of striped to unstriped frogs is close to 1:1. It is of course possible while on a short walk to see perhaps half a dozen frogs all or mostly striped (or unstriped) but repeated observations will probably reveal that about half of the wood frogs at a particular site have a mid-dorsal stripe. In southern Ontario striped wood frogs are absent while to the North around James Bay about 80% are striped (Schueler and Cook, 1980). The frequency of striped individuals decreases to around 20% westward toward the eastern prairies. It has been suggested that unstriped individuals transform earlier however this appears not to be the case in Alberta. The stripe certainly makes the frog difficult to see in a pond containing grass however the distribution of striped frogs is not directly related to the grassiness of ponds. This species also comes in a wide variety of colours ranging from gray through many shades of brown to a very reddish brown. Patches of lighter or darker pigment may occur on the back or the sides of the frog may come in a single solid colour. Some individuals may have small dark spots while others are densely spotted with a salt and pepper pattern. The raised glandular ridges separating the sides from the back (dorsolateral folds) are infrequently offset by light colours giving rise to two striped individuals (three if a mid-dorsal stripe is present).

The Canadian toad usually has greenish or brownish colours on its back and sides. Cook (1964) described a rusty colour phase of this species from Manitoba and central Saskatchewan. I have found rusty coloured individuals at Cold and Muriel Lakes in east central Alberta. In Alberta only young of the year rusty coloured toads were found. In young toads the cranial crests (often used to identify the species) are absent or poorly developed so these uncrested rusty phase toads may be difficult to identify. The absence of adult rusty phase toads may indicate that this colour morph does not survive well or that individuals change colour with age. Cook also noted the small size of rusty phase toads in his collections. Perhaps large rusty adults do occur but are extremely rare.

The western toad is also typically a cryptic greenish or brownish colour however brightly coloured adult females may occasionally be found throughout the range of this species. Female toads are larger on average than males and are more boldly marked. Those with bright red, black and white markings are very

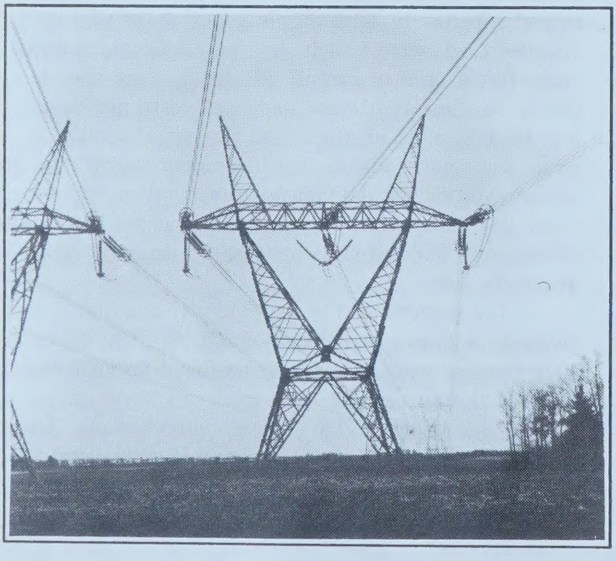
Contintinued on page 7........

Common Raven Nesting in Edmonton

Ernie Kuyt

In Canada the common raven breeds from islands in the high Arctic south into the forested areas of central Canada. In Alberta's boreal forests it breeds as far south as Winagami Lake and in the mountainous parts of Alberta as far south as Waterton Lakes (Godfrey 1986). East of the foothills, the raven has nested as far east as Nanton and in winter, ravens have been seen sporadically near Mundare, Edmonton, Pigeon Lake and Calgary (Salt and Salt 1976). On 20 January 1992 I saw a pair of ravens just west of Lloydminster, Alberta.

Statements made by earlier ornithologists that in North America, ravens decrease with advancing civilization (Taverner 1945), are no longer or not always true. Ravens in Europe generally shun human presence but in the Northwest Territories ravens are the most conspicuous year-round birds in northern communities. During my 1957-1976 residence in Yellowknife and Fort Smith, NWT, not a day passed when I did not see and hear this typical northern bird.



Raven nest site: Hydro towers near University of Alberta Ellerslie Research Station -- within Edmonton city limits. Photo by Ernie Kuyt

In forested areas of the NWT, ravens usually nest in coniferous trees (white spruce), rarely in trembling aspen, and in the latter case, old nests of red-tailed hawks may be used. Cliff sites in forested areas are also used. In and north of tree line habitat in the NWT, ledges of cliffs are most commonly used but along the Thelon River, NWT I also found ravens nesting in tree or cliff nests formerly or subsequently used by gyrfalcons (Kuyt 1980).

Near human habitation, ravens will utilize man-made structures such as buildings or hydro towers. In 1972, I banded two young ravens taken from the bell tower of the long abandoned church at Stanton on the Arctic coast east of the Anderson River delta. T.W. Barry (pers. comm.) advised that the raven's nest site had been in use many years.

On 15 April 1970 a raven's nest and six eggs were removed by a power company crew from one of the metal hydro towers 128 km west of Fort Smith. The eggs were successfully hatched by two Fort Smith residents but all six young died at two weeks of age. I believe this to be one of the earliest records of ravens nesting in the hydro towers near Fort Smith. The powerline was constructed in 1965-1966.

Motorists now travelling Highway #5 between Hay River, NWT and Fort Smith will see anywhere from 10-15 bulky raven stick nests (most of them in use) in the tall metal hydro towers along the highway. An occasional nest is used by red-tailed hawks.

From 1976 until recently, I never saw ravens in or near Edmonton and I was not aware of their occurrence here. It was with a good deal of surprise when about the end of February 1992 I heard the raucous call of a raven when I was clearing snow from my driveway in South Edmonton. Looking up, I saw two ravens flying side by side in a northerly direction over the Calgary Trail, less than 100 m away.

A quick call to Cam Finlay confirmed that the sighting was unusual. Salt and Salt (1976) indicate that in recent times the frequency of appearances by ravens seems to be increasing, particularly in west-central Alberta.

Since my February 1992 sighting I have kept my eyes open for potential raven nest sites. On 22 March 1992 my wife and I spotted two ravens flying towards a tall metal hydro tower south of Edmonton. The birds landed near a bulky stick nest on the tower. Later that day I returned and saw one raven sitting on the nest, the other one on the tower. In the early afternoon a week later when I drove past the site again, I observed the birds in what appeared to be copulatory behaviour on the nest.

The hydro tower, estimated to be 15-20 m high, is one of a long series of towers, running about east-west and less than 1 km north of the Ellerslie Road in the vicinity of the University of Alberta Ellerslie Research Station and MacTaggart Sanctuary. The nest site is thus within the Edmonton city limits.

I am unsure if there are any other previously recorded nest sites for the Common Raven in Edmonton.

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COMMON RAVEN

Continued from page 5........

attractive and have been seen occasionally along much of the foothills and at the Wagner Natural Area. Why such brightly coloured females occur remains a mystery however appearing different is a phenomenon frequently seen within many of our amphibian species.

One of the important lessons learned from studying (vertebrate) zoology is that animals within a species are different from one another in the same fashion that humans are. They don't all look identical and their behaviour is not identical. As human beings we benefit from a lifetime of experience developing skills that enable us to identify individual humans as well as supplementary information regarding for example the sex, age, health or attitude of individuals with whom we interact. People experienced with pets or livestock know it is possible with practise to develop the same skills with animals. While animals of a species tend to look somewhat alike and often behave in a stereotypic manner there are real and sometimes pronounced individual differences. The individual variation in appearance exhibited by amphibians is outstanding among our terrestrial vertebrates. We simply don't know enough about their behaviour, microhabitat choice, or relationship with predators to account for these differences. What we can do is learn to identify the species for what they are in spite of their great variation. Perhaps by paying more attention to how individuals of a particular colour or pattern behave or in what microhabitats they spend their time we may begin to understand why they don't all look the same and not necessarily like the one in the book.

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A Great Gray Displaces a Great Horned Owl on a Nest

W.H. Hoffmann

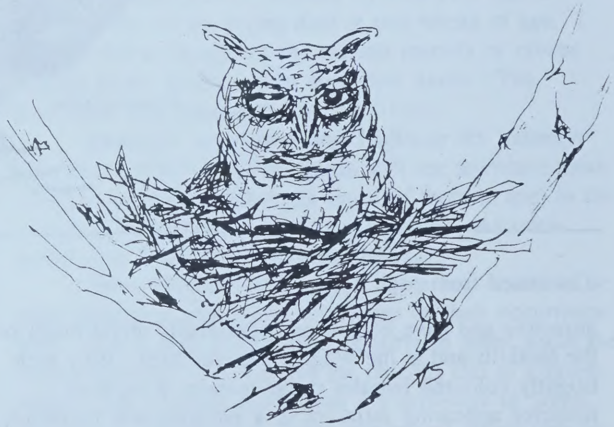
I didn't believe it at first either! According to Robert Nero, an authority on great gray owls, great horned owls have been known to prey on great grays. But not this time!

The nest, located in the boreal forest an hour-and-a-half's drive west of Edmonton, had been first discovered by Bob Gehlert and Ed Jones some 20 years earlier. They proceeded to record the nesting events on film. We first visited the same nest several years ago, finding a horned owl on it in the spring. Again, the following spring a great horned owl used it. It was obvious that the platform was in such a sorry state that I wondered if it could withstand the repeated landings of the adults returning with prey and the young hopping around during pre-flight training. We were surprised that it held together - - just barely. In the winter we rebuilt it, using a make-shift willow basket which was solidly nailed to a double fork in the lodgepole pine

Nero first mentioned using artificial nest platforms for great grays. This was the first time we would try it, although we have had some success with the technique for horned owls and some other raptors. What better place to put a basket than where a nest had been that was once used by great grays? Would they return?

A great horned owl used our artificial nest the first spring. Last year (1991) I visited the nest in early April. Nearby, the meadow was cratered by a myriad of plunge-holes, presumably made by great grays. I was excited, thinking that we had a nest. From a distance I saw a form sitting on the nest. Binoculars revealed a great horned owl instead. She flushed when the nest was approached. Not investigating further, we left.

Less than a week later, Doug Latimer returned to the nest, hoping to set up a blind from which to photograph the owls. To everyone's surprise, he found a great gray staring down at him! The developments which led to the great gray usurping the nest from the great horned owls makes for some interesting speculation. Unfortunately there are a lot of unknowns. We didn't know what stage of incubation the eggs of the horned owl were at (if indeed she had eggs at all). We do know that the great gray laid five eggs during that week, just before Doug's visit. All five young were successfully fledged. We documented the nesting event on film and video.



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Announcement

The Birding Game

Rarely does one come across a game that can honestly be described as great entertainment, remarkably educational, and exceedingly attractive. But that is exactly what is available now that The Birding Game with Roger Tory Peterson is beginning to appear in stores and catalogues. It is a rare find because it provides great entertainment for the whole family, is an enjoyable way for everyone to learn more about the identification, natural history, behaviour, and conservation of birds, and is an exceedingly attractive product that incorporates the Field Guide artwork of artist and naturalist, Roger Tory Peterson, in a bold graphic design. It's the perfect environmentally-oriented gift for everyone who enjoys birds or wants to learn more about them. Look for this new game at nature-oriented stores.

Have You Ordered It?

The Atlas of Breeding Birds of Alberta will be available to the public on October 28, 1992.
To save 20% off retail, order your copy before August 2, 1992
Phone 453-8629

Pine Martens Stalk Snowshoe Hare

J. Derek Johnson

At our Goose River wetland drainage site 38 km southeast of Valleyview (see Johnson (1987) for a description of the site), "rabbit runs" abound. In fact, one of the problems we have had at the site is the snowshoe hares chewing the plastic coating off of the armoured cable used in our instrument network. The hares have become true "vinyl junkies."

This past September, while doing field work sectioning trees to determine their growth rates, a rare event in my experience occurred. Just after lunch, our technician and I were measuring the diameters of the sections of one of our trees. I was standing up reading off the measurements to him. What I did not realize was that I was standing across a game trail. As I was giving a set of numbers I felt something brush up against my foot. I looked down and there was a snowshoe hare nosing up against my foot. It had come up along the game trail until it encountered my foot. It seemed to want to continue along the trail, but it was apparently unwilling to detour around my foot. After a few seconds pause, it turned around, went back up the game trail a short distance, and then headed south toward one of the drainage ditches. Other than an amusing diversion, I did not think anything of this sighting until a few minutes later.

Probably less than two minutes after the hare arrived, there was more rustling along the game trail. I looked up to see a sleek, brown, relatively large weasel-like mammal. I knew right away that it had to be either a fisher or a marten. As the animal approached, the relatively light brown colour, stiffly erect ears, and evident throat patch steered me toward a marten. This was exciting because I had only seen a marten once before while I was doing my master's thesis research on Ram Mountain southeast of Nordegg. Within seconds of the first animal appearing, a second one came up behind it. The lead animal seemed intent on continuing up the game trail, but was deterred by our presence. It began to move back and forth in front us, appearing more curious than afraid. At its closest approach it came within about 5 m. The second animal stayed more in the shadow of the shrubbery, not venturing as close to us. After about a minute or so the animals seemed to lose interest and moved off in the direction the hare had taken. It was at this point that I started to wonder if the martens were not stalking the hare and that the hare's reluctance to retreat when it encountered my foot was because it was aware of the martens' presence behind it. Interesting speculation, but we will never know just how the situation turned out. This close encounter with two pine martens was definitely the wildlife highlight of last summer's field work.

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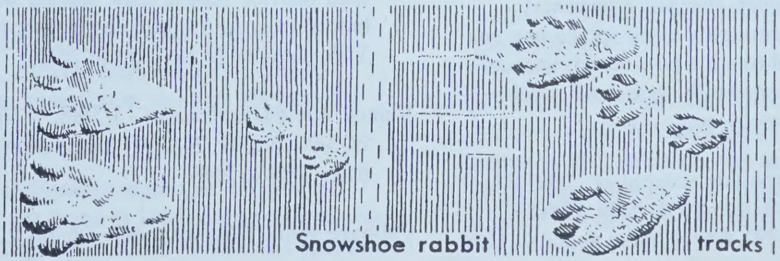

An Update on the Butterflies of the Redwater Sand Dunes

Norbert G. Kondla

I previously presented an annotated list of the butterflies and skippers of the Redwater sand dune area (57-20W4) based on 20 visits from 1977 to 1980 (Kondla 1985). From 25/7/87 to 24/7/91, I made an additional 25 visits to this study area. The following people accompanied me on various occasions: T. Kondla, C. Kondla, J. Belicek, S. Belicek, and C. Schmidt.

The purpose of this paper is to update the published record, provide a composite flight calendar based on the cumulative 45 visits to the study area, comment on habitat affinities of certain species, and comment on the *Speyeria atlantis* complex. The following annotated list reports on those species found from 1987 to 1990. Dates of observations or captures are given and these are followed by commentary.

No single published source can be identified for common and zoological names used in this paper. Butterfly nomenclature has been quite dynamic and controversial in recent years and there is no single source that represents the consensus of butterfly students. The common names used herein essentially represent the results of discussions between the writer, C.D. Bird, G.J. Hilchie, E.M. Pike and F.A. Sperling. Zoological nomenclature at the genus level is taken from Scott (1986) while species level names are derived from a variety of published and unpublished contemporary sources.

Annotated List

Hesperiidae

Dreamy Duskywing *(Erynnis icelus)* - 1/5/88 (earliest known Alberta flight date), 28/5/89, 31/5/89, 12/6/89, 17/6/89, 25/6/89, 26/5/90, 6/6/91, 19/6/91; much less abundant than during the previous study period, almost absent in 1988; mostly found in grassy fens in 1989; extreme flight dates 1/5 to 25/6.

Common Checkered Skipper *(Pyrgus communis)* - 29/5/88 on a cutline through a black spruce bog and 25/6/89 on a cutline through a pine forest; unusual records for this predominantly grassland species; new species for the study area.

Arctic Skipper *(Carterocephalus palaemon)* - 21/5/88, 28/5/88, 29/5/88, 5/6/88, 28/5/89, 31/5/89, 12/6/89, 17/6/89, 25/6/89, 26/5/90, 6/6/91; more abundant than during previous study period, found mostly in fens in 1988 and in grassy forest clearings in 1989 and 1991; extreme flight dates 21/5 to 25/6.

Garita Skipper *(Oarisma garita)* - 13/7/88, 6/7/89; uncommon in open grassy areas; extreme flight dates 20/6 to 21/7.

Yellowpatch Skipper *(Polites peckius)* - 26/7/87, 19/6/88, 24/7/91; on grassy cutline through mixed woods; rare; new species for study area.

Tawny-edged Skipper *(Polites themistocles)* - 19/6/88 in a fen; rare; new species for the study area; northernmost known locality for this species in North America.

Long Dashed Skipper *(Polites mystic)* - 19/6/88 and 6/7/89 in fens; rare; new species for study area.

Roadside Skipper *(Amblyscirtes vialis)* - 28/5/88; not found in 1989 or 1991; extreme flight dates 28/5 to 9/6.

Papilionidae

Tiger Swallowtail *(Papilio canadensis)* - 15/5/88, 21/5/88, 28/5/88, 29/5/88, 31/5/89, 12/6/89, 17/6/89, 6/7/89, 6/6/91; fairly common; seen flying through all habitats, often under cool and cloudy conditions when no other butterflies were in flight; extreme flight dates 15/5 to 6/7; until recently this taxon was treated as a subspecies of *Papilio glaucus,* research has shown that *Papilio canadensis* and *Papilio glaucus* are in fact different species (Hagen et al. 1991).

Pieridae

Western Checkered White *(Pieris occidentalis)* - 29/4/89, 6/5/89, 22/7/89, 20/8/89; not found in 1988; two-brooded, with the spring brood being smaller and with heavier ventral dark scaling than the summer brood; extreme flight dates, spring brood 29/4 to 31/5, summer brood 22/7 to 26/8.

Veined White *(Pieris napi)* - 1/5/88, 13/7/88, 6/5/89, 26/5/90, 6/6/91, 24/7/91; uncommon; extreme flight dates 15/5 to 26/8.

Cabbage White *(Pieris rapae)* - 26/7/87, 15/5/88, 28/5/88, 26/5/90, 24/7/91; not found in 1989; extreme flight dates 15/5 to 26/8.

Large Marbled White *(Euchloe ausonides)* - 21/5/88, 28/5/88, 19/6/91; not found in 1989; much reduced population in comparison to previous study period; extreme flight dates 4/5 to 9/6.

Yellow Sulphur *(Colias philodice)* - 13/7/88, 26/7/88, 28/5/89, 31/5/89, 12/6/89, 22/7/89, 20/8/89, 24/7/91; found in small numbers in a variety of habitats; extreme flight dates, spring brood 28/5 to 12/6, summer brood 13/7 to 26/8.

Giant Sulphur *(Colias gigantea)* - 19/6/88, 17/6/89, 25/6/89, 6/7/89, 22/7/89; generally uncommon in willow fens; both males and females were encountered in forest areas some distance from the nearest fen; males were found nectaring on alfalfa and *Crepis* sp.; extreme flight dates 17/6 to 22/7.

Pink-edged Sulphur *(Colias interior)* - 26/7/87, 13/7/88, 6/7/89, 22/7/89, 20/8/89, 24/7/91; correction, previous report for 2/7/79 should read 21/7/79; fairly common in pine forest with blueberry in the understory; extreme flight dates 6/7 to 20/8.

Lycaenidae

Bronze Copper *(Lycaena hyllus)* - 24/7/91; rare in fen; new species for study area.

Dorcas Copper *(Lycaena dorcas)* - 26/7/87, 13/7/88, 6/7/89, 22/7/89, 20/8/89; locally distributed in variable abundance in some fens; occasionally found nectaring in upland clearings; extreme flight dates 6/7 to 26/8.

Purplish Copper *(Lycaena helloides)* - 19/6/88; apparently a rare visitor to the study area.

Brown Elfin *(Callophrys augustinus)* - 1/5/88, 15/5/88, 21/5/88, 28/5/88, 29/5/88, 29/4/89, 6/5/89, 9/5/89, 26/5/90; common in open pine forest; extreme flight dates 29/4 to 9/6.

Hoary Elfin *(Callophrys polia)* - 1/5/88, 15/5/88, 21/5/88, 28/5/88, 29/5/88, 6/5/89, 9/5/89, 26/5/90; common in open pine forest; extreme flight dates 30/4 to 10/6.

Eastern Pine Elfin *(Callophrys niphon)* - 21/5/88, 28/5/88, 6/6/91; not found in 1989; uncommon in pine forest; extreme flight dates 21/5 to 9/6; this species spends most of its time in the tree canopy and is most often seen imbibing moisture on bare soil or nectaring on pincherry and chokecherry flowers.

Western Tailed Blue *(Everes amyntula)* - 28/5/88, 29/5/88, 19/6/88, 17/6/89, 6/7/89, 6/6/91; uncommon in pine forest; extreme flight dates 28/5 to 6/7.

Spring Azure *(Celastrina argiolus)* - 1/5/88, 15/5/88, 21/5/88, 28/5/88, 29/5/88, 5/6/88, 29/4/89, 6/5/89, 9/5/89, 28/5/89, 26/5/90; fairly common in upland forest in the vicinity of red osier dogwood; extreme flight dates 19/4 to 9/6; listed in the previous paper as *Celastrina ladon*; recent work by various researchers has shown that *argiolus* is preferred; the taxon *lucia* which occurs throughout most of Alberta is most likely a distinct species, so in the future these populations will likely be known as *Celastrina lucia.*

Silvery Blue *(Glaucopsyche lygdamus)* - 21/5/88, 29/5/88, 31/5/89, 12/6/89, 6/7/89, 26/5/90, 6/6/91; found in small numbers in forest clearings; extreme flight dates 21/5 to 6/7.

Greenish Blue *(Plebejus saepiolus)* - 19/6/88, 17/6/89, 25/6/89, 6/7/89, 6/6/91, 19/6/91; uncommon along a pipeline right of way with clover; new species for the study area; extreme flight dates 25/6 to 6/7.

Nymphalidae

Great Spangled Fritillary *(Speyeria cybele)* - 26/7/87, 13/7/88, 22/7/89, 24/7/91; fairly common in upland forest; extreme flight dates 13/7 to 26/7.

Aphrodite Fritillary *(Speyeria aphrodite)* - 26/7/87, 13/7/88, 22/7/89, 20/8/89, 24/7/91; fairly common in clearings and open pine forest; extreme flight dates 13/7 to 27/8.

[See Discussion for clarification of nomenclature for next two entries.]

Northwestern Fritillary *(Speyeria electra)* - 26/7/87, 19/6/88, 13/7/88, 17/6/89, 25/6/89, 6/7/89, 22/7/89; common in poplar and mixed forest; extreme flight dates 19/6 to 22/7.

Boreal Fritillary *(Speyeria hollandi)* - 26/7/87, 19/6/88, 13/7/88, 6/7/88, 6/7/89, 22/7/89, 20/8/89, 24/7/91; common in pine forest and mixed forest; extreme flight dates 19/6 to 20/8; seen nectaring on fireweed, a plant that does not normally attract butterflies.

Bog Fritillary *(Boloria eunomia)* - 28/5/88 (earliest known Alberta flight date), 29/5/88, 5/6/88, 19/6/88, 12/6/89, 17/6//89, 25/6/89, 6/7/89, 6/6/91, 19/6/91; locally common in spruce bogs and birch/willow fens; extreme flight dates 28/5 to 6/7.

Silver-bordered Fritillary *(Boloria selene)* - 26/7/87, 28/5/88, 29/5/88, 5/6/88, 19/6/88, 17/6/89, 25/6/89, 6/7/89, 22/7/89, 19/6/91; fairly common locally in some fens and moist forest clearings; extreme flight dates 28/5 to 22/7.

Meadow Fritillary *(Boloria bellona)* - 26/7/87, 8/5/88 (earliest known Alberta flight date), 15/5/88, 21/5/88, 28/5/88, 29/5/88, 5/6/88, 13/7/88, 31/5/89, 12/6/89, 17/6/89, 25/6/89, 20/8/89, 6/6/91; fairly common in forest clearings; extreme flight dates 8/5 to 26/8.

Frigga's Fritillary *(Boloria frigga)* - 15/5/88 (earliest known Alberta flight date), 21/5/88, 28/5/88, 29/5/88, 5/6/88, 28/5/89, 31/5/89, 12/6/89, 17/6/89, 26/5/90, 6/6/91; fairly common in birch/willow fens and open portions of spruce bogs; extreme flight dates 15/5 to 17/6.

Freya's Fritillary *(Boloria freija)* - 1/5/88, 15/5/88, 21/5/88, 6/5/89, 9/5/89, 31/5/89, 26/5/90; commonly seen in all habitats except dense forest; extreme flight dates 1/5 to 3/6.

Titania's Fritillary *(Boloria titania)* - 26/7/87, 13/7/88, 22/7/89, 20/8/89, 24/7/91; common in pine forest; extreme flight dates 13/7 to 27/8; most often seen nectaring on goldenrod and other yellow flowers.

Northern Crescentspot *(Phyciodes morpheus)* - 26/7/87, 19/6/88, 13/7/88, 25/6/89, 6/7/89, 22/7/89, 24/7/91; locally common in mixed forest and poplar forest; extreme flight dates 6/6 to 26/7; reported in the previous paper as *P. pascoensis.*

Tawny Crescentspot *(Phyciodes batesii)* - 19/6/88, 13/7/88, 17/6/89, 25/6/89, 6/7/89, 22/7/89, 19/6/91; locally common in forest; extreme flight dates 6/6 to 22/7.

Satyr Anglewing *(Polygonia satyrus)* - 26/7/87, 9/5/89, 12/6/89; uncommon in forest; extreme flight dates 19/4 to 26/7.

Green Anglewing *(Polygonia faunus)* - 26/7/87, 1/5/88, 28/5/88, 29/5/88, 31/5/89, 12/6/89, 21/4/90, 26/5/90, 24/7/91; uncommon in forest; extreme flight dates 19/4 to 7/8; erroneously reported as subspecies *rusticus* in the previous paper, populations in this area of Alberta appear to be a cline between subspecies *faunus* and subspecies *arcticus.*

Hoary Anglewing *(Polygonia gracilis)* - 29/4/89, 9/5/89, 17/6/89; uncommon; extreme flight dates 29/4 to 17/6; despite the work of Scott (1984), the *P. gracilis/ zephyrus* complex in Alberta needs more study. Of relevance to this part of the province is the presence of 2 phenotypes in the boreal forest. One has a dark gray/light gray ventral surface; the other has a dark brown/light brown ventral surface. Neither of these phenotypes matches described taxa. It is not known yet if these are color morphs of the species or if two distinct species are involved in this puzzle.

Gray Anglewing *(Polygonia progne)* - 15/5/88, 28/5/88, 13/7/88, 29/4/89, 28/5/89; uncommon; extreme flight dates 29/4 to 13/7.

Mourning Cloak *(Nymphalis antiopa)* - 26/7/87, 13/7/88, 29/4/89, 31/5/89, 12/6/89, 20/8/89; uncommon; extreme flight dates 29/4 to 20/8.

Milbert's Tortoiseshell *(Nymphalis milberti)* - 20/8/89; rare.

Painted Lady *(Vanessa cardui)* - 6/6/91, 19/6/91, 24/7/91; this species invades Alberta on an irregular basis with past mass migrations in 1973 and 1983; 1991 saw another mass migration with spring records of worn migrants and fresh, locally bred individuals seen in late July.

White Admiral *(Limenitis arthemis)* - 19/6/88, 6/7/89, 22/7/89, 24/7/91; fairly common in poplar forest and willow stands; extreme flight dates 19/6 to 24/7.

Satyridae

Prairie Ringlet *(Coenonympha inornata)* - 21/5/88, 28/5/88, 19/6/88, 13/7/88, 12/6/89, 17/6/89, 6/7/89, 22/7/89; uncommon in dry fens and grassy clearings; extreme flight dates 21/5 to 22/7.

Large Wood Nymph *(Cercyonis pegala)* - 26/7/87, 13/7/88, 22/7/88, 20/8/89, 24/7/91; fairly common in grassy clearings and open forest; extreme flight dates 13/7 to 20/8.

Disa Alpine *(Erebia disa)* - 29/5/88, 5/6/88, 12/6/89, 17/6/89; new species for study area; uncommon and local in one black spruce bog.

Red-disked Alpine *(Erebia discoidalis)* - 1/5/88, 15/5/88, 21/5/88, 6/5/89, 9/5/89, 26/5/90; locally common in fens, uncommon in upland areas; extreme flight dates 1/5 to 9/6.

Common Alpine *(Erebia epipsodea)* - 21/5/88, 28/5/88, 29/5/88, 5/6/88, 12/6/89, 17/6/89, 25/6/89; uncommon in meadows and clearings; extreme flight dates 21/5 to 25/6.

Macoun's Arctic *(Oeneis macounii)* - 12/6/89, 17/6/89, 25/6/89, 6/7/89, 6/6/91, 19/6/91; fairly common in open pine forest and clearings; extreme flight dates 6/6 to 6/7.

Jutta Arctic *(Oeneis jutta)* - 28/5/88 (earliest known Alberta flight date), 5/6/88, 12/6/89, 17/6/89, 25/6/89, 6/6/91, 19/6/91; uncommon in open spruce bog, fens and open pine forest bordering fens; this species appears to be partly biennial since observations show significantly greater abundance in odd-numbered years.

Species Analysis

With the addition of the six new species reported herein and by treating the *Speyeria atlantis* complex as two distinct species, the known fauna now consists of 59 species. By using updated information on the provincial fauna for comparison, this still represents about one-third of the known provincial fauna. The percent of total fauna represented by each family is as follows (provincial breakdown in brackets for comparison) : Hesperidae 17(17), Papilionidae 2(4), Pieridae 12(14), Lycaenidae 20(22), Nymphalidae 37(31), Satyridae 12(12). These figures show that the Redwater fauna is consistent with the provincial fauna from the perspective of representation of major taxonomic groups, except for the larger representation of the Nymphalidae in the Redwater fauna.

The revised species count changes the figures previously given in terms of distribution elements. The presently known fauna consists 57% of widely distributed species, 28% of essentially boreal forest species and 12% of species whose primary distribution is associated with the aspen parkland and prairie regions to the south. Two species, *Euptoieta claudia* and *Vanessa cardui*, are not part of the normal fauna and occur only as irregular migrants.

Although admittedly qualitative, some observations on changes are possible between what was found in the late 1970s (period 1) and the late 1980s (period 2). *Pyrgus communis, Polites peckius, Polites themistocles, Polites mystic, Lycaena hyllus, Plebejus saepiolus* and *Erebia disa* were not found in period 1; while *Erynnis persius, Hesperia assiniboia, Lycaena helloides, Harkenclenus titus, Plebejus rusticus, Euptoieta claudia,* and *Nymphalis vau-album* were not found in period 2.

Period 1 coincided with generally high water tables in the fens and bogs. During period 1, field work was largely concentrated on upland habitats. During period 2, I found very low water tables and very low mosquito populations. This made it attractive to sample the fen and bog habitats more intensively.

The reduced populations of *Erebia epipsodea, Erebia discoidalis,* and *Coenonympha inornata* in period 2 are likely a reflection of drier habitat conditions. Mustard plants were notably uncommon in period 2 and this is speculated to be the cause of reduced *Euchloe ausonides* numbers. A prolonged tent caterpillar infestation in period 2 seriously defoliated most deciduous trees and shrubs. This may be a consideration in the reduced *Papilio canadensis* numbers.

Phenology

Table 1 is a flight calendar based on the combined data sets for the two study periods. Each month is divided into three phenology units: early = day 1 to 10, middle = day 11 to 20, late = day 21 to month end. Table 1 thus provides a convenient comparative display of the times of the year that each species has been found in the study area.

The phenology data shows a pronounced peak in species diversity from late May to middle June, with the greatest diversity having been found in early June (57% of known species). This is the earliest diversity peak of any area yet documented in Alberta. It is a surprising finding, since one would expect that southern prairie study areas would have an earlier diversity peak for climatic reasons.

It must be emphasized that the displayed flight periods are a composite of observations over a number of years and therefore should not be interpreted as the flight period in any given year. Flight periods can and do vary dramatically in response to seasonal weather. For example, the peak flight of *Boloria frigga* was 1 to 2 weeks later in 1989 as compared to 1988. Extensive cloudy periods can extend the flight period, as shown by *Coenonympha inornata* and *Oeneis macounii* in 1989 when individuals emerged on a very staggered basis over several weeks.

Based on flight phenology and examination of butterfly condition in the field, it is clear that several species have two broods per year. These are: *Pieris occidentalis, Pieris napi, Pieris rapae, Colias philodice,* and *Boloria bellona.* Two species, *Polygonia progne* and *Nymphalis milberti,* may be two-brooded here on the basis of observations in other Alberta localities. *Boloria selene* is reported to be two-brooded elsewhere. If further work shows this to be the case in the present study area, it would be a different phenomenon than the other two-brooded species insofar as there is no obvious temporal gap in adult flight.

Future field work may add the following non-resident species to the known fauna of the area: *Colias eurytheme, Vanessa atalanta,* and *Limenitis archippus.* In the previous paper I speculated that *Thorybes pylades, Plebejus idas* (as *Lycaeides argyrognomon)* and *Plebejus optilete* might be found in the area. The failure to locate these species after extensive field work makes their presence highly unlikely.

Habitat

Seven species in the study area are dependent on bogs and fens: *Colias gigantea, Lycaena hyllus, Lycaena dorcas, Boloria eunomia, Boloria frigga, Erebia disa,* and *Oeneis jutta.* The boreal forest habitats of these species have been mostly incorrectly reported in the literature (eg. Scott 1986, Pyle 1981, Tilden and Smith 1986, Opler and Krizek 1984). Hooper (1973) and Klassen et al. (1989) provide better habitat descriptions for these species but they portray most of these species as being bog inhabitants.

These species do in fact occur in bogs in various parts of their North American range. However in most of Alberta, and particularly the Redwater sand dunes, they are far more prevalent in fens. This oversight probably stems from the fact that very few lepidopterists have spent much time in the central North American boreal forest environment and fewer still have used the extensive literature on wetland ecology in applying terms such as "bog".

Wetlands of various classes cover large areas of Canada and it is therefore not surprising that wetland terminology here is well developed. The Canadian Wetland Classification System (National Wetlands Working Group 1987) is used herein as the authoritative source of definitions. A bog is defined as a peatland, generally with the water table at or near the surface. Bogs are acid and low in nutrients. In contrast, a fen has the water table at or just above the surface, with nutrient-enriched water.

Vegetation differences resulting from these fundamental ecological differences are usually dramatic. In the present study area, bogs are almost all treed (black spruce) with moss-rich understories and abundant Labrador tea. Small areas of non-treed bogs occur. Fens, on the other hand, are dominated by willows and bog birch, with significant areas dominated by sedges and grasses.

Following is a list of the bog and fen species with comments on what the major literature has to say about their habitats, what habitat they actually use in the Redwater area, and more general habitat observations. Also included in the list are several species that are not predominantly bog and fen species but which have suffered from habitat descriptions that do not fit the reality observed in the Redwater area or in Alberta generally.

Colias gigantea - variously reported in willow bogs, wet meadows with willow, taiga, relict acid bogs, moist areas of willow, extremely boggy areas, cismontane willow bogs. At Redwater it is clearly a basin fen species. Males were usually seen patrolling just above, at the edges of and through the willows in fens. At other boreal locations in Alberta and north-eastern British Columbia, I have found it in stream fens. Populations in the northern foothills are associated with stream fens and dry willow-rich meadows in valley bottoms. Populations also occur in extreme southwestern Alberta in grassy foothills environment. Here they occupy spring and seepage areas with willows.

Lycaena hyllus - reported as occuring in wet meadows, marshes, swamps, prairie sloughs and streamsides. Observations at Redwater, and other Alberta boreal forest locations, show that it is also a resident of fens.

Lycaena dorcas - consistently reported as a bog species in the literature. At Redwater and other boreal forest sites in Alberta and northeastern British Columbia, I have found it to be primarily a fen species, although it does occur in open spruce bogs. Available literature consistently lists *Potentilla fruticosa* as the foodplant, but at Redwater, and some other Alberta sites where I have found this species, only *Potentilla palustris* grows in the fens and is assumed to be the foodplant.

Boloria eunomia - variously reported as occuring in bogs, marshes, swamps and moist tundra. Although I found it in bogs at Redwater, the major populations occur in willow/birch fens. In other parts of Alberta it has been found in bogs, swamps, moist alpine tundra, dry alpine tundra and fens.

Boloria selene - correctly reported as inhabiting moist meadows, marshes, wet grassy sloughs, forest openings and spring-fed areas. From observations at Redwater and other Alberta localities, various classes of fens can be added as regular habitat for this species.

Boloria frigga - variously reported in shrub-willow bogs, willow bogs in coniferous forests, willow thickets, and grassy boggy areas in tamarack swamps. Although weak populations were found at Redwater in open spruce bog, primary habitat, as determined by the presence of vigorous populations, is willow fens. Willow and birch fens are the primary habitat throughout its range in Alberta.

Boloria freija - variously reported in bogs and valley forest openings, willow bogs, bogs, open grassy areas in boreal forests and dry bogs. Ferris et al. (1983) assert that "throughout its range *freija* is associated with boggy areas." In the Redwater area I found it to be essentially a species of dry habitats - open jack pine forest and clearings. It was also found in dry fens. In Alberta it is primarily a pine forest species. In the Cypress Hills and Kleskun Hill it flies in aspen poplar forest and adjacent grassland. The most productive populations I have found are on mats of *Dryas drummondii* growing on dry valley bottom alluvial fans and higher portions of braided stream channels.

Boloria titania - variously reported in moist valley bottoms to arctic/alpine tundra, moist valley bottoms and bogs in coniferous forests, bogs, taiga, alpine meadows, wet willow bogs, meadows, openings in spruce and tamarack bogs, and spruce and pine woods. The core habitat at Redwater is mesic jack pine forest although it was frequently seen in dry pine forest. Spruce and pine forest areas are the primary habitat in Alberta. It is not largely a bog species here. The strongest populations occur in jack pine and lodgepole pine forest.

Erebia disa - consistently reported as being a denizen of spruce bogs. This agrees with my experience at Redwater where it was very clearly tied to black spruce bogs.

Erebia discoidalis - variously reported as inhabiting dry open grassy areas, moist prairie, meadows, dry open northern forest, swampy clearings among willows, spruce bogs, sedge marshes and pine forests. At Redwater I found it to be primarily a fen species that also moved into upland meadows under suitable moisture conditions. I have found the strongest populations in boreal Alberta in sedge/grass fens and birch/willow fens. In the aspen parkland it is a marsh and fescue grassland insect. In the foothills and mountains it is locally abundant in valley bottom meadows.

Oeneis jutta - variously reported as occuring in spruce bogs, tamarack swamps and lodgepole pine forest (in the Rocky Mountains). It does inhabit open spruce bogs at Redwater but I found the greatest abundance in fens. Males perch on the ground and on lower tree parts in open jack pine forest at the edges of the fens but when disturbed they usually retreat to the nearby fens. Females were found mostly in the fens. Observations here and elsewhere in Alberta show this species to be as much a fen resident as a bog resident. Where it does fly in bogs it is in areas with a much more open canopy than that preferred by *Erebia disa*.

Speyeria Atlantis Complex

Recent checklists and most books recognize one species in the *Speyeria atlantis* complex. Howe (1975) recognized separate eastern and western species. Klassen et al. (1989) agreed with this approach for Manitoba populations. I concur with the comment made by Moeck (1957): "...we cannot escape the uneasy thought that possibly there has been misdetermination of one or more valid species, now lumped in the complex."

The situation in Alberta is quite clear, insofar as there are two distinct species in what is generally known as *Speyeria atlantis*. It is less clear just what names are most correct to use according to the rules of nomenclature. This is due to uncertainty in United States populations and whether or not *hollandi* is a species or a subspecies in relation to nominate *atlantis*.

The two species that occur in Alberta are a) a smaller butterfly with a reddish disc, and b) a larger butterfly with a chocolate to blackish-brown disc. Disc refers to the basal two-thirds of the ventral hindwing in *Speyeria*. These species are herein called *electa* and *hollandi*, respectively, for the sake of consistency with Howe (1975) and Klassen et al. (1989). Further research at the continental level may show that *electa* is not the best name at the species level for the western moiety. It may also show that *hollandi* is a subspecies of nominate *atlantis*. However, this would not change the reality of two species, whatever their correct names, in the boreal forest of Alberta.

Table 2 lists the readily observable differences between the two taxa, based on field work over 13 years and examination of about 1000 individuals. Prior literature contains extremely little information on the differences between these taxa. This is not surprising because very few lepidopterists have examined boreal forest *Speyeria* populations in detail. The differences between *S. electa* and *S. hollandi,* noted in Table 2, are greater than the differences between local populations of *S. electa* and *S. aphrodite* (Table 3), which are also frequently confused in the boreal forest of Alberta, Saskatchewan and Manitoba as well as many other parts of their ranges where populations are sympatric.

Speyeria species, subspecies and populations are notoriously variable from one geographic location to another (Grey 1989). Consequently, descriptions and comparisons are valid only over defined parts of species ranges with similar ecological characteristics. The species-pair appearance differences noted in Tables 2 and 3 describe differences in Alberta boreal forest populations and should not be wholly extrapolated to other parts of the ranges of these species.

Given the phenotypic, phenological and ecological differences between *S. electa* and *S. hollandi,* it makes good biological sense to treat them as separate species. Taxa with the scope of differences described herein, with extensive sympatry and with no published data to support the occasional allegation of hybridization, are normally accorded species status.

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Tiger Swallowtail *(Papilio glaucus)*

Photo by Tom Webb

Table 1.

Flight calendar for butterflies of the Redwater study area. An x indicates that the species has been found during the particular phenology unit. A o indicates it has not.

Species	APR	MAY	JUN	JUL	AUG
Erynnis icelus	ooo	xox	xxx	ooo	ooo
Erynnis persius	ooo	ooo	xoo	ooo	ooo
Pyrgus communis	ooo	oox	oox	ooo	ooo
Carterocephalus palaemon	ooo	oox	xxx	ooo	ooo
Oarisma garita	ooo	ooo	oxo	xxx	ooo
Hesperia assiniboia	ooo	ooo	ooo	ooo	xoo
Polites peckius	ooo	ooo	oxo	oox	ooo
Polites themistocles	ooo	ooo	oxo	ooo	ooo
Polites mystic	ooo	ooo	oxo	xoo	ooo
Amblyscirtes vialis	ooo	oox	xoo	ooo	ooo
Papilio canadensis	ooo	oxx	xxo	xoo	ooo
Pieris occidentalis	oox	xox	ooo	oox	oxx
Pieris napi	ooo	xox	xoo	oxx	oox
Pieris rapae	ooo	oxx	ooo	oox	oox
Euchloe ausonides	ooo	xox	xxo	ooo	ooo
Colias philodice	ooo	oox	xxo	oxx	xxx
Colias gigantea	ooo	ooo	oxx	xox	ooo
Colias interior	ooo	ooo	ooo	xxx	ooo
Lycaena hyllus	ooo	ooo	ooo	oox	ooo
Lycaena dorcas	ooo	ooo	ooo	oxx	xox
Lycaena helloides	ooo	ooo	xoo	ooo	ooo
Harkenclenus titus	ooo	ooo	ooo	ooo	xoo
Callophrys augustinus	oox	xxx	xoo	ooo	ooo
Callophrys polia	oox	xxx	xoo	ooo	ooo
Callophrys niphon	ooo	oox	xoo	ooo	ooo
Everes amyntula	ooo	oox	xxo	xoo	ooo
Celastrina argiolus	oxx	xxx	xoo	ooo	ooo
Glaucopsyche lygdamus	ooo	oox	xxo	xoo	ooo
Plebejus saepiolus	ooo	ooo	xxx	xoo	ooo
Plebejus rusticus	ooo	ooo	xoo	ooo	ooo
Euptoieta claudia	ooo	ooo	xoo	ooo	ooo
Speyeria cybele	ooo	ooo	ooo	oxx	ooo
Speyeria aphrodite	ooo	ooo	ooo	oxx	xxx
Speyeria electa	ooo	ooo	oxx	xxx	ooo
Speyeria hollandi	ooo	ooo	oxo	xxx	xxo
Boloria eunomia	ooo	oox	xxx	xoo	ooo
Boloria selene	ooo	oox	xxx	xxo	ooo
Boloria bellona	ooo	xxx	xxx	oxx	xxx
Boloria frigga	ooo	oxx	xxo	ooo	ooo
Boloria freija	ooo	xxx	xoo	ooo	ooo
Boloria titania	ooo	ooo	ooo	oxx	xxx
Phyciodes morpheus	ooo	ooo	xxx	xxx	ooo
Phyciodes batesii	ooo	ooo	xxx	xxx	ooo
Polygonia satyrus	oxx	xoo	oxo	oox	ooo
Polygonia faunus	oxo	xxx	oxo	oox	xoo
Polygonia gracilis	oox	xoo	xxo	ooo	ooo
Polygonia progne	oox	xxx	ooo	oxo	ooo
Nymphalis vau-album	ooo	ooo	xoo	ooo	xoo
Nymphalis antiopa	oox	oxx	xxo	oxo	oxo
Nymphalis milberti	ooo	ooo	ooo	ooo	oxx
Vanessa cardui	ooo	ooo	xxo	oox	oox
Limenitis arthemis	ooo	ooo	oxo	xox	ooo
Coenonympha tullia	ooo	oox	xxo	xxx	ooo
Cercyonis pegala	ooo	ooo	ooo	oxx	xxo
Erebia disa	ooo	oox	xxo	ooo	ooo
Erebia discoidalis	ooo	xxx	xoo	ooo	ooo
Erebia epipsodea	ooo	oox	xxx	ooo	ooo
Oeneis macounii	ooo	ooo	xxx	xoo	ooo
Oeneis jutta	ooo	oox	xxx	ooo	ooo

Table 2. Comparison of *Speveria electa* and *Speveria hollandi.*

Speyeria electa	Speyeria hollandi
throughout Alberta except open prairie grassland	essentially boreal forest and northern foothills ecoregions; valleys in front ranges of Rocky Mtns.
mostly poplar forest; dry to mesic habitats	mostly coniferous forest and mixed forest including bogs; mesic to wet habitats
smaller, forewing radius - males av. 27mm(n = 21), females av. 28mm(n = 13)	larger, forewing radius - males av. 30mm(n = 21), females av. 32.5mm(n = 21)
earlier peak flight where sympatric	later peak flight where sympatric
Often pale and reddish-brown disc	Often very dark and chocolate to blackish-brown disc
thinner black markings on forewing surface	wider black markings on forewing surface
wider pale ventral hindwing submarginal band	narrower pale ventral hindwing submarginal band
ventral hindwing marginal silver triangles generally smaller and capped with reddish brown	ventral hindwing marginal silver triangles generally larger and more broadly capped with blackish-brown
dorsal surface paler orange	dorsal surface darker orange
ventral hindwing disc with areas of tan scales	ventral hindwing disc with areas of greenish- blue scales
ventral hindwing median silver spots weakly bordered by pale spots	ventral hindwing median silver spots strongly bordered by dark spots
dorsal marginal band black and orange	dorsal marginal band mostly black
dorsal marginal band narrower	dorsal marginal band broader
male dorsal forewing veins with black scaling	male dorsal forewing veins with broad black scaling
ventral hindwing submarginal band crossed by light veins	ventral hindwing submarginal band crossed by dark veins

Table 3. Comparison of *Speveria electa* and *Speveria aphrodite*

Speyeria electa	Speyeria aphrodite
throughout Alberta except open prairie grassland	dry forests, especially pine in boreal areas;open prairie grasslands and parkland; rare in southern mountains, absent from northern mountains
mostly in more mesic habitats	mostly in more xeric habitats
smaller	larger
earlier peak flight where sympatric; late June and early July	later peak flight where sympatric; late July and early August
dorsal veins in males "thick" and covered with black scales	dorsal veins in males "thin" and essentially without black scales
dorsal marginal band black and orange	dorsal marginal band orange except for darker scaling along veins
forewing distal margin straight	forewing distal margin usually curved inward
ventral hindwing disc mostly reddish-brown with small areas of tan scales	ventral hindwing disc mostly reddish-brown and usually with large areas of tan scales
dorsal surface paler orange	dorsal surface brighter, more intense orange
pale ventral hindwing submarginal band wider	pale ventral hindwing submarginal band narrower
dorsal surface with extensive basal black scaling	dorsal surface with much less basal dark scaling; basal dark scales on hind wing form a linear smudge

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Hummingbirds in Cadomin

Marlene Reich

I started to keep track of the hummingbirds, mainly because of the fact that we had such late springs in Cadomin, and I didn't want them to arrive and have nothing to eat. I always put my feeders out a week before their earliest arrival date. We are advised to take our feeders down early in the fall so as not to encourage the birds to stay around till it's too late for them to fly south for the winter. I have never noticed this. It seems when they are ready to leave, the complete group leaves. Usually the day before, you notice a real burst of activity at the feeders, with many more birds feeding than usual. The next day they are gone. We have had the odd straggler show up. In 1986 we had a real snow storm around the 7th. of October when one showed up. He stayed under the eaves on a perch that we have hanging there, feeding from the feeder which we had left out. When the skies cleared two days later he was gone.

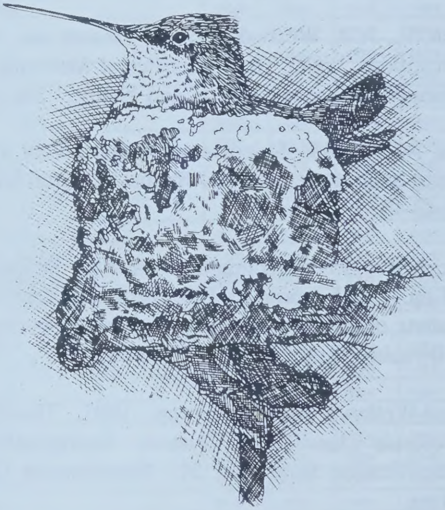
My fascination with hummingbirds started many years ago, while I was on a vacation in Bella Coola, B.C. I was doing some work in our camper with the door open, when I heard a funny buzzing sound, like a bee. Turning around to swat it, I saw my first hummer. I was impressed. So small, so fast, such colours.

We were delighted when we moved to Cadomin, when a neighbor informed us that there were hummingbirds here. I had spent most of my growing up years in Mercoal just a few miles down the road and had not been aware of them. That first spring we hung out the feeders hoping to attract some of these fascinating wee birds. We were not disappointed: we had three females and one male the first year. The number of birds in one area usually stays pretty much the same. Some years we have four or five females with two males, but never more than that.

The male usually only hangs around till the females have built their nests and the wildflowers have started to bloom. Sometimes they will show up if we have a cold spell during the summer. He sure makes himself know while he is here! If we are out working in the yard, and he feels that we are too close to the feeder, he dive bombs us. He flies up into the sky till he is a mere speck, diving down at us going tat-tat-tat-tat, usually right close to our heads. No fear at all. He is also very territorial. We have a feeder hanging on each side of the house and he sits on the telephone line with a good view of both of them and doesn't hesitate to drive away anything that goes near them.

When you watch these birds closely you begin to recognize each one of them. We had one female who was quite a bit larger than most and has been at the feeders from the first. This is the first year that she did not show up, which gave us a sense of sadness.

Through reading about and watching the hummingbirds we feel that we have enriched our lives. We would like more people to realize that they should not put red food dye in the nectar since it weakens the shells of the eggs, and lessens the chance of the babies hatching out. Also the nectar should be emptied out of the feeders at least once a week, and the feeders washed and rinsed well, as they harbour a great deal of bacteria.



Arrival Dates	Departure Dates
1983 - May 9th.	1983 - Sept. 21st.
1984 - May 4th.	1984 - Sept. 12th.
1985 - May 10th.	1985 - Oct. 15th.
1986 - May 15th.	1986 - Sept. 5th.--Oct. 9th.
1987 - May 5th.	1987 - Oct. 4th.
1988 - Apr. 26th.	1988 - Aug. 10th.
1989 - May 8th.	1989 - Sept. 6th.
1990 - May 21st.	

Author's Address
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Book Reviews

Earthcycles and Ecosystems

Beth Savan. Kids Can Press Ltd. 96 pp., $9.95 paperback.

Are we really creating an environmental citizenry in formal and nonformal education settings? So far, the answer depends on whether individual educators have taken the initiative to infuse environmental education into their programs. Of course, this can be a difficult task unless resources are available. *Earthcycles and Ecosystems* is an entry into the juvenile literature which offers to be such a resource. Indeed, it is an excellent primer in the study of ecology.

The author, twice recipient of the Canadian Science Writers' award, has included 96 pages, most of which are illustrated with black and white drawings which will captivate the imagination and interest of children from nine years to fourteen years, approximately grade four to eight.

Chapter One defines an ecosystem, and shows how the sun powers the earth. Next it focuses on habitats and the variety of disruptions humans have caused.

Air, and particularly air pollution, is the subject of Chapter Two. Wisely, the problem of indoor air pollution is illuminated. As new-home construction often includes a tighter vapour barrier, this potent form of air pollution needs to be studied. Several experiments and even a board game show the effect of air borne pollutants on plants and animals, including humans. Minor sections on the ozone layer and the concept of "greenhouse gases" close the chapter.

The third chapter on water addresses pollution primarily, although water conservation demonstrations are suggested for children to try. One page titled "Poison in the Parlor", shows warning labels found on cleaners and other household chemicals that end up going down the drain and offers alternatives of a much less toxic variety.

Chapter Four, covers the soil cycle. The role of decomposers, including an intriguing page on "How the earthworm ate the robin", the need for soil conservation, and of course the Rs of waste management are topics found in this chapter.

This book accomplishes what it sets out to do. One strength is the numerous "action trail" symbols which attempt to promote children taking responsible action. It does a fair job of being relatively bias balanced in addressing the social aspects of environmental problems, too. Some colour photos would improve the readability.

Earthcycles and Ecosystems would be acceptable as a book for mom or dad and a junior ecologist to work through at bed time and on weekends. For a Cub, Scout, Brownie, Guide, Ranger, or Junior Forest Warden leader, there would be great value in having this book in the home library. A class set of this book in a school library would be a real asset because sections of it could be utilized by many grade levels in their study of the Interdependence of Living Things in the science program. The many experiments and demonstrations would lend themselves nicely to Science Fair projects, also. Hopefully, this book and others like it will have a long future on earth.

Richard J. Moore

The Alberta Naturlist is the main communication bridge between clubs and members throughout the province.

WANTED:

EDITOR FOR ALBERTA NATURALIST

Responsibilities: The editor solicits articles, reviews and edits submitted copy, directs design and layout, assists with setting policies and procedures and directs the production of four issues annually.

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The successful applicant will co-produce one issue with the present editor:

For further information, contact the FAN office at 453- 8629 or Anna Robertson at 822-2220.

Gray Wolf - Red Wolf

Dorothy Hinshaw-Patent. Photographs by William Munoz. Hardcover, 64 pages. Clarion Books, New York, 1990. $15.95 (US funds).

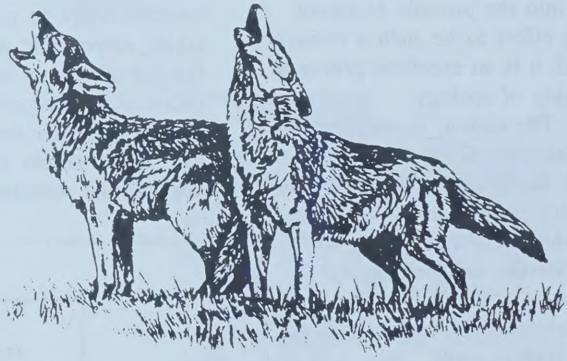
The list of publications about wolves keeps getting longer. This attractive booklet seems to have been written primarily for children, but the text is suitable for adults as well. Illustrated with 59 colour photographs, the four chapters are subdivided into short subtitles, which makes their contents clear at a glance.

The first two chapters deal briefly with wolf biology, such as family life, territories and howling. The last two chapters include topical and up-to-date information on wolf recovery in the northwestern States, the proposed reintroduction into Yellowstone National Park, and the heroic efforts of conservation agencies to prevent the imminent extirpation of red and Mexican wolves. Canada, the home of most of North-America's wolves, gets only a brief mention here and there, and not always positive. For instance, according to the author, aerial wolf hunting and bounties are outlawed and that wolves straying from Glacier National Park "have been killed by the guns of Canadian hunters."

The author forgets to mention that the recent return of wolves to the northwestern United States, where they had been exterminated long ago, was made possible in the first place by enlightened wolf management policies in adjacent provinces. It is Canadian wolves, dispersing southward from British Columbia and Alberta, that are now recolonizing Montana, Idaho and Washington State, to the delight of American naturalists, wildlife managers and (six out of ten) hunters.

The professional quality of this booklet should make it very worthwhile for American readers, particularly school teachers, but I would not recommend its contents for Canadian children.

Dick Dekker



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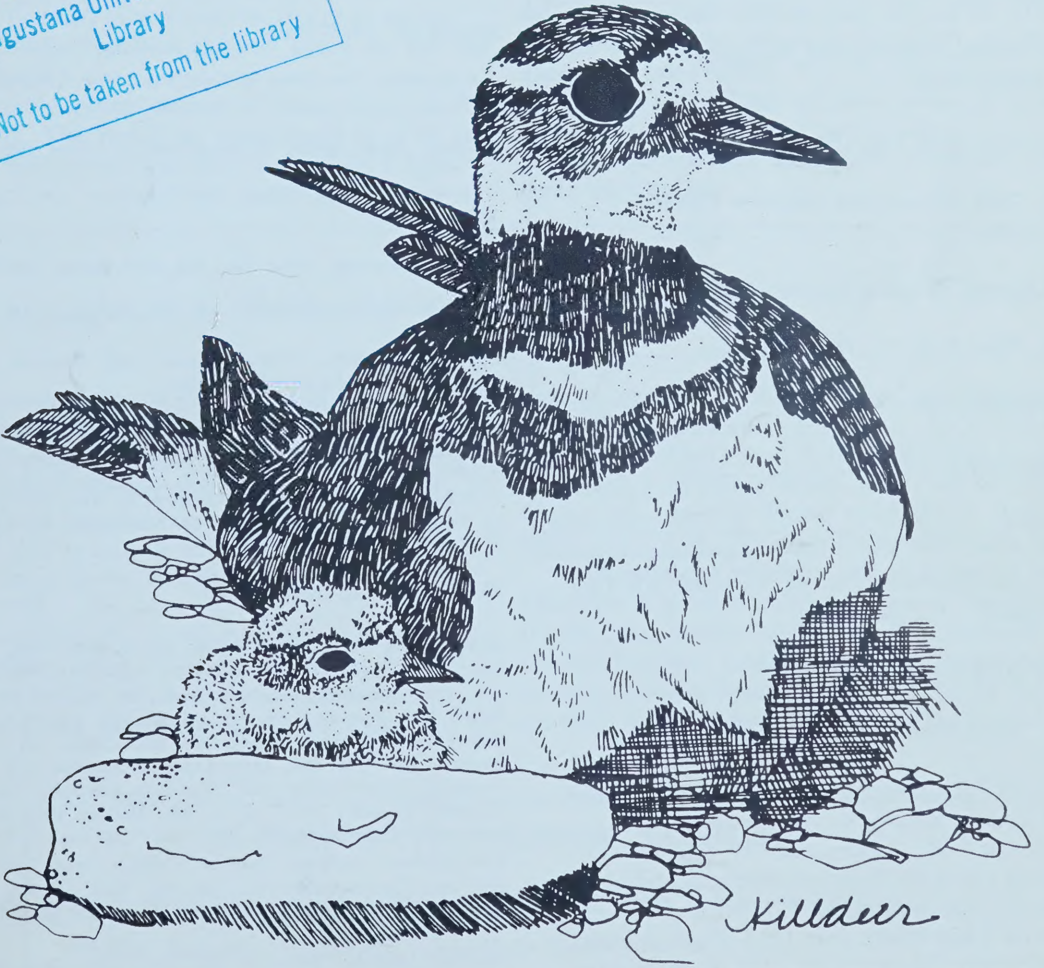

The Atlas of Breeding Birds of Alberta - An Owler's Paradise - Northern Cardinal
Unusual Alberta Breeding Records
Mosquito, What Bird Ye?

ALBERTA NATURALIST

Volume 22, Number 3, October 1992

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CONTENTS

President's Page....1

Loren L. Goulden Memorial Award Nominations....1

Atlas of Breeding Birds of Alberta, Glen Semenchuk....2

Northern Alberta - An Owler's Paradise, Petra & Kathy Stubbs....4

FAN's Summer Field Trip, Don Stiles....6

Alberta's Third Documented Northern Cardinal, Teresa Dolman....8

Unusual Alberta Breeding Records, Edgar T. Jones....9

Mosquito, What Bird Ye?, Phil Henderson....11

Baillie Birdathon, Gerry Lunn....17

Announcements....19

Book Review....20

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals; July 15, FAN, Box 1472, Edmonton, AB T5J 2N5
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forestry Cdentre, 5320 - 122 St., Edmonton T6H 3S5.

Compiler cooperation is greatly appreciated.

Patron: Hon. Dr. J.W. Grant MacEwan

The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;
(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;
(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;
(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;
(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research, and other activities whether of a similar or dissimilar nature;
(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united postions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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President's Page

R. Barry Jenkins

Summers in this part of the world are too short. It's almost fall and it seems like the snow has just melted. It has certainly been a strange summer, with a drought in the north and too much rain in the south. Farmers in the north will be buying their winter's hay from southern Alberta, the reverse of the usual procedure.

There was a very good field trip to visit the Vermilion River Naturalists on July 24th and 25th and I wish to thank them for a very enjoyable and interesting weekend. I have been through this area a number of times, but like most people have never stopped to take a good look at this part of the Parkland. What especially made this trip memorable for me was the addition of a "life bird" (a turkey vulture) and the chance to see the Lakeland College Vermilion Campus, where my son will be going this fall.

The fall directors' meeting in Hinton should also be interesting. That part of the world should be in full fall glory and I hope to see more than the inside of a board room. Please note that the dates of this meeting has been changed to October 9th, 10th and 11th.

The hearings of the Natural Resources Conservation Board into the Three Sisters proposal in Canmore have been held and have been an education for everyone involved. The dedication and hard work of those involved, particularly Maryhelen Posey, Don Stiles and Ingrid Ehtvedt is greatly appreciated.

The Bird Atlas sales have been very encouraging to date. We planned on printing 5,000 copies and we have almost the entire run presold either directly or through the commericial dealers. We are looking into expanding the print run, but we must be careful as unsold remainders would very quickly put the project "in the red". In conjuction with the retail sales of the Atlas we are also marketing a "Watchable Wildlife" calendar through the same outlets. This is a joint project with Alberta Fish and Wildlife and takes advantage of the marketing we are already doing for the Atlas.

I hope you have had a good summer and can get out to enjoy the fall.

Loran L. Goulden Memorial Award Nominations

Nominations for the Loran L. Goulden Memorial Award for outstanding contributions to natural history in Alberta are sought at all times, but to be considered for the 18th Annual Award nominations should reach the Chairman of the selection committee by 1st December 1992. The 18th award will be presented at the Annual General Meeting of the Federation of Alberta Naturalists in January 1993.

Nominations may be for contributions in any field of natural history within the province of Alberta. All previous nominations of persons who have not yet received the award will be considered, but nominators of such persons are encouraged to up-date these nominations. Previous awardees have been: Dick Dekker, W. Ray Salt, Charles D. Bird, Robert Lister, Joy Finlay, John M. Powell, Lois Fenna, Martin McNicholl, Fred Schutz, George Freeman, Tim Myres, Kerry Wood, Marg Reine, Mary Lore, Lloyd Lohr, Cam Finlay and Myrna Pearman.

Nominations should be sent in writing to the Chairman or given to another member of the committee (Lloyd Lohr, Stettler; Derek Johnson, Edmonton; Graeme Greenlee, Lethbridge; David Ealey, Chairman Loran L. Goulden Memorial Award Selection Committee 3903 - 105 St., Edmonton, Alberta T7J 2K7, 434-0841).

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If you are looking to apply for FAN's one-time-only grant, contact Jim Goodwin, Finance Director. Telephone: 922-4585 (in the evenings for details).

The Atlas of Breeding Birds of Alberta

Glen Semenchuk

After six years in the making,the *Atlas of Breeding Birds of Alberta* is in the publication stage. The combined efforts of over a thousand volunteers and a number of organizations and corporations were necessary to allow this project to succeed.

Why Do We Need An Atlas?

The specific objectives of the *Atlas* are to:
1. Provide baseline information which will assist in the management of Alberta's bird species, particularly non-game and endangered species.

2. Increase our knowledge pertaining to breeding, distribution, and significant areas of concentration.

3. Collect the information in a standardized format to ensure that the database is generally compatible with other atlas projects and usable for future monitoring programs.

4. Encourage and facilitate public involvement in wildlife management activities.

5. Promote public education by increasing public awareness and understanding of Alberta's wildlife and its management.

6. Create an organizational infrastructure to enable volunteers to participate in future natural history projects.

All of the above mentioned objectives outline the value of publishing an Alberta Bird Atlas. It is needed because the availability of detailed information regarding individual species is not consistent but was dependent on research priorities and the uneven distribution of settled areas. The specific benefits of an atlas are:
1. A documented baseline data source on birds distribution, relative abundance and habitats for biologists and other research professionals' use, as well as a guide for tourists and resident naturalists.

2. The determination of which species are sufficiently scarce to be vulnerable, and distributional data on these species.

3. Documentation of unique and fragile habitats vital to continued reproduction for certain species.

4. Provide reference information for environmental impact assessments.

5. A starting point for trend indications in bird population studies.

The *Atlas* will prove to have social benefits as well. The spirit of cooperation among government agencies and the general public will be enhanced by their mutual striving towards a valuable conservation goal. It will provide recreational and educational opportunities for Albertans and will generate tourism. Lastly, public education in regards to wildlife management will be improved.

Methodology

The following is a brief overview of the methods used to atlas the province and compile the database.

In order to gather breeding evidence in a systematic manner, the province was divided into 10 regions. Each region was assigned a Regional Coordinator (RC) who in turn assigned atlassers to 10 km x 10 km squares of Alberta, using the Univeral Transverse Mercator (UTM) grid system. The RCs were responsible for providing project materials and expertise to the volunteers as well as collating results of the data cards.

There are over 8,000 10 km x 10 km UTM squares in the province, and the majority of them are located in remote areas. Key areas were designated as "priority squares"; one square out of each block of four (20 km x 20 km block) was surveyed, based on the greatest amount of habitat diversity. Due to limited access and low atlasser population in northern Alberta, it was decided that a minimum of one square for each 100 km x 100 km block would represent a priority square. To ensure adequate square coverage, atlassers were encouraged to survey all habitat types in a square and consult species lists compiled by the RCs. Although a minimum of 20 hours of surveying effort per priority square was recommended, this figure could change, depending on variations in habit diversity, topography and forest type. Atlassers filled out one data card for each assigned square, per year. They recorded location, hours and dates of atlassing, species, breeding, and abundance codes. Even with all of the volunteer efforts, coverage of the province was still concentrated in the urban areas by the fourth year of data collection. Therefore, in the last year, an intensive effort was undertaken to achieve comprehensive coverage of remote and rural areas. This was accomplished by implementing five data collection methods including: the traditional volunteer effort; a campaign that solicited data from other researchers; a Remote Areas Program that assisted volunteers in planning a variety of field trips; a Blockbusters Program, whereby student employment programs were utilized to hire atlassers; and a secondment program that borrowed employees from donor agencies.

Data collection "techniques" were standardized through a quarterly newsletter, contact with the RCs, and regional atlasser meetings. The completed data cards were sent to project headquarters, serialized in a master logbook, and entered onto a Compaq 386-20 computer. The data input process contained several check systems, but a manual verification of computer files against data cards was conducted before those cards were stored.

The database system is comprised of 12 databases and over 60 individual programs for data entry, data editing, report production and map production. Digital species maps were produced using MAPINFO and dBase IV. MAPINFO was chosen because of its ability to work with dBase files directly, and its ability to produce maps in a number of digital formats. A program written in dBase reads the Bird Atlas database files and produces a dBase file which is later read by MAPINFO to produce the map for that individual species.

A base map has been created with different colours depicting the natural regions of the province. These six regions are Grassland, Parkland, Foothills, Boreal Forest, Rocky Mountain, and the Canadian Shield. This map was needed because of an expected correlation between habitat and species sightings. The individual species digital maps produced in MAPINFO were then converted to a GEM format using the HiJaak graphic conversion software. The base map and species map were overlaid using GEM Artline. These final maps were converted to a Postscript format using HiJaak. To generate a finalized draft of a species page in the Atlas, the postscript files were then merged with the WordPerfect text and a scanned photograph.

Atlas Highlights

This 400 page volume will contain data on 270 nesting species, 32 migrants, and 4 regular winter visitors, as well as a list of all vagrant and extirpated or extinct species. The Atlas will also include a history of ornithology in Alberta, a thorough description of the natural regions of the province, an in-depth explanation of atlassing methods, and an extensive bibliography divided into three sections: historical, general, and family. An inestimable contribution to the book is the selection of colour photographs, which have been gathered from top wildlife photographers around the province. The Atlas will be an invaluable purchase available in retail stores on October 28.

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Spruce Grouse

Photo: Allan Yuill

Northern Alberta - An Owler's Paradise

Petra Stubbs and Kathy Stubbs

On a recent trip to northern Alberta, we were pleasantly surprised at the number of owls that make this area their home each winter.

Our trip started out on a fine winter morning (March '91) with a clear blue sky and a flurry of activity from backyard blue jays, common redpolls and black-capped chickadees.

We were barely on our way before encountering our first owl - a beautiful male snowy sitting atop a telephone pole on the Highway 2 overpass to Onoway.

As we passed through the small town of Manning, the weather started to worsen - blowing snow and grey overcast sky.

''Wait a minute! What was that?'' A small, dark bundle of soggy feathers sitting on top of a telephone pole. ''Another owl! But which species exactly?'' We were lucky to receive full cooperation from the little fellow, as we slowly backed up, rolled down our windows, and took a closer look at his fieldmarks.

Although wet clumps of falling snow made visibility poor, we could clearly identify 'angry looking' eyebrows, black bordered facial discs, and clearly barred brown underparts that distinguish a northern hawk owl *(Surnia ulula)* from other small owls. When the owl tired of us, it smoothly launched off its perch and swung low to the ground before re-perching in a tree further back from the highway.

We were barely on our way less than 20 minutes later when we again came to a screeching halt. A second owl was spotted again perched on a power pole alongside the highway. Although we now confirmed to ourselves that these were indeed northern hawk owls, we were troubled by their size which appeared somewhat smaller than the 16" suggested in the National Geographic Society's FIELD GUIDE TO THE BIRDS OF NORTH AMERICA (1987).

That night while recounting our observations to our hosts in High Level, we consulted Salt and Salt's THE BIRDS OF ALBERTA (1976) where a size of 13"-15" reflected more accurately the birds we had seen.

While travelling to Rainbow Lake the next morning, we kept a keen eye on the roadsides with the help of my niece and nephew Kyla and Chase Stubbs. We were quickly rewarded - a great gray owl approximately 20 km west of High Level. We stopped long enough to get a good look at his large size, round facial discs, and distinctive white moustache.

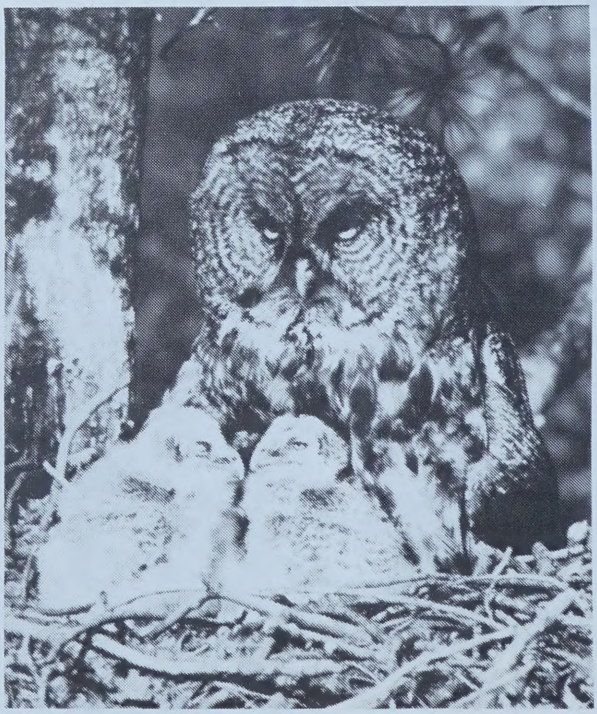
Three more great grays were seen in the next 20 km. All 4 grays had been sighted on the north side of the road, in tall aspen or mixed-wood stands.

That day we also saw 5 more northern hawk owls, a snowy owl, numerous redpolls, pine grosbeaks, evening grosbeaks, and black-capped chickadees.

We played owl tapes that evening (dusk) in areas where we knew there were owls but elicited no response.

The next day we headed home to Edmonton and counted 14 northern hawk owls between High Level and Twin Lakes. These occurred on both sides of the highway sitting high up in aspen or spruce trees.

We again stopped and played hawk owl recordings but the only response received was an indignant ruffling of feathers. This lack of results provided us with some lengthy discussion on the way home. The owls should have been in their courtship period, but clearly they were not impressed with us or our attempt at imitating their call!



Great Gray Owl and family Photo: R.E. Gehlert

Meanwhile we turned our attention to how far apart we were seeing each bird. Using the odometer as a rough estimator we found the owls (at least the ones we could spot from the highway) were anywhere from 1 to 12 kms apart with an average distance of 5.85 km (Std. dev. 2.97) between birds.

As we recounted our story to friends over the next few days we wondered if this seeming abundance of owls was out of the ordinary. Talking to several local northerners, they felt there had been an increase in owls in the past two years but when pressed further, they also noted that they had really only started to pay attention to birds in the past 2 years as word of the breeding atlas and other birding projects spread north. Certainly I can remember as a girl growing up in northern Alberta there being a high number of owls both large and small throughout the '70s. How I wish I'd paid more attention to them now! Similarly, Volume 1 of ALBERTA BIRDS, 1971 - 1980 (Pinel, Smith, & Wershler) report northern hawk owls were commonly seen in the winters of 1973/74 and 1974/75 even as far south as the Edmonton area.

If only we could ask the owls themselves...

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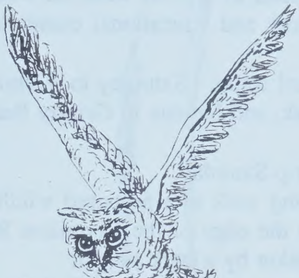
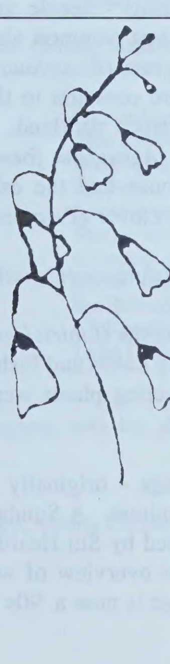


"I am myself and what is around me, and if I do not save it, it shall not save me"

Jose Ortega Y Gasset
frin Nedutuatuibs ib Quixote



I am a steward of the Earth. I have a responsibility to God, to Myself, and to my Children to protect the Earth every day. Though my needs may be satisfied, I look beyond Myself on a troubled world. Though I am but one person, I believe that my contribution is essential.

Geoffrey Pounder

FAN Summer Field Trip

- July 24 to 26, 1992 -

Hosted by the Vermilion River Naturalists, Vermilion, Alberta

Don Stiles

FAN's 1992 summer field trip to the Aspen Parkland region of Alberta, hosted by the Vermilion River Naturalists, one of FAN's newer clubs, treated 16 out of town participants to a great weekend with natural history, human history and educational components. Activities included:

1. Early morning bird walks - Saturday to Vermilion River Provincial Park, and Sunday to Grizzly Bear Coulee.
2. An all day field trip Saturday.
3. A Saturday evening walk to a proposed wildlife viewing platform at the edge of the Vermilion Reservoir, and a brief presentation by a park ranger.
4. A Sunday morning tour of Lakeland College.

Our home base was Group Camp "A" at Vermilion River Provincial Park where an evening potluck supper provided fellowship opportunities. Special thanks to our leaders Stu Heard (club president), Carol Klar, Suzanne Benoit, and Tom Brown.

Vermilion River Provincial Park - a gem of 1800 acres on the northwest outskirts of Vermilion. It includes north-facing aspen slopes on the edge of the Vermilion River Reservoir, an upper facilities area with 112 campsites and an old railroad station converted to a museum. Our early morning bird walk through the aspen wood and along the shore of the reservoir yielded at least 25 species of birds, mostly woodland birds, with a few waterfowl still about (list appended). A proposed viewing station on a peninsula will be a welcome addition for the public to view waterfowl.

Grizzly Bear Coulee - (named after the plains grizzly, long since extirpated), about 15 km southwest of Vermilion. Lots of marsh here - highlights were young sora feeding at the edge of the reeds. Lloyd Lohr also saw a young common snipe.

The Saturday Field Trip -

1. A visit to the location of two fur trading posts on the North Saskatchewan River near Elk Point - Fort George operated by the Northwest Co. and Buckingham House operated by the Hudson's Bay Co. These two forts were separated only by a ravine. Proximity enhanced business, they believed. They were only active for about 10 years, from 1792 to 1802 until the furs ran out. A brand new visitor centre opened recently marking the bicentennial of the forts. It gives the visitor an idea of what life was like in those years (mostly hard work). Our visit was made more meaningful by summer students on staff who gave us guided tours of the visitor centre and the fort sites.
2. Whitney Lakes Provincial Park - an area left behind by the glaciers - now consist of four lakes and surrounding lands, mostly swampy. Our hike was along an esker. There was once a river beneath the glacier which left behind a sand bar, now the esker. It was very dry and gravelly compared to the surrounding lakes and swamps, which sometimes had black spruce.
3. The Frog Lake Massacre Site - a cairn and crosses mark the site where six Hudson's Bay Co. workers and two priests were killed by Indians. This incident was one of those which precipitated the Riel Rebellion in 1885.
4. Interesting birds - a turkey vulture was seen by one carload of people in the morning near Elk Point. Another, (or the same bird?), was seen by most of the group near Frog Lake, about 30 km to the east about 4 pm. This is a rare sighting for the Vermilion area. A large number of white pelicans were seen on the far side of Fishing Lake, which is east of Frog Lake.
5. Interesting plants - needle and thread or spear grass *(Stipa comata)* was common along the esker, and a patch of blue grama grass *(Bouteloua gracilis)* was seen also. Both of these are common to the prairies farther south but rare in the aspen parkland.

- Giant hyssop *(Agastache foeniculum)* - Fort George-Buckingham House and the esker.
- Purple prairie clover *(Petalostemon purpureum)* - the esker.
- White evening primrose *(Oenothera nuttallii)* - the esker.
- Meadow blazing star *(Liatris ligulistylis)* - side of the road between Whitney Lakes and Fishing Lake.

These four flowering plants were new or rare to most of the participants.

Lakeland College - originally was called Vermilion School of Agriculture. A Sunday morning tour from 10 am to noon led by Stu Heard, an instructor at the college, gave an overview of what's happening there. Lakeland College is now a '90s institution. It still includes agriculture, and agriculture related courses such as horticulture and agricultural mechanics, but also such courses as recreation and environmental technology. It is a regional college, with satellites in Vegreville, Lloydminster, and Maidstone, Sask.

Two modern features of the college presented by Stu Heard:

1. Student involvement in their courses. For example, agricultural students operate the college farm year round, with limited direction from the instructors.
2. Involvement of the local business community. They were asked ''What skills do you want students from here to have?'' The answers - computer skills, communication skills, both oral and written, and math skills. Hence all students are taught these skills, no matter what their major.

Bird Species seen or heard at Vermilion River Provincial Park - July 25, 1992, 6-8 am.

Common loon
Canada goose
Least flycatcher
Bonaparte's gull
Northern harrier
Alder flycatcher
Purple martin
Bank swallow
Black-capped chickadee
House wren
Gray catbird
Cedar waxwing
Yellow warbler
Song sparrow
Northern oriole
Red-necked grebe
Unidentified ducks
Killdeer
Red-winged blackbird
Black tern
Downy woodpecker
Northern flicker
Tree swallow
Barn swallow
Swainson's thrush
Warbling vireo
Clay-colored sparrow
Unid. sparrows
Pine siskin
Eared grebe
Common goldeneye
Spotted sandpiper
Rock dove
Eastern kingbird
Black-billed magpie
American robin
Tennessee warbler
House sparrow

Bird Species seen or heard at Grizzly Bear Coulee - July 26, 1992, 7-8 am.

Red-necked grebe
Common snipe
Barn swallow
Red-eyed vireo
Common yellowthroat
Red-winged blackbird
Common goldeneye
Sora
Mourning dove
White-throated sparrow
Blue-winged teal
Vesper sparrow
Canvasback
Tree swallow
Song sparrow
Mallard
Spotted sandpiper
Marsh wren
Chipping sparrow
Cedar waxwing
Bufflehead
Cliff swallow
Least flycatcher

Our thanks to Howard Throughton with his sharp eyes and ears for this list.

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Alberta's Third Documented Northern Cardinal

Teresa Dolman

On December 14, 1991, Victor and Marilyn Hafichuk observed a bird at one of their feeders which was different from any they had seen before: it had a distinct head crest and a stout pink bill. A search through the field guide suggested a northern cardinal, and its buff-brown body with reddish patches indicated a female. However, according to the guide, cardinals aren't supposed to be anywhere near Alberta but rather southern Ontario and the eastern and southern regions of the United States. So the Hafichuks phoned the Helen Schuler Coulee Centre in Lethbridge and also Teresa and Doug Dolman in Lethbridge to ask if anyone was interested in confirming the bird's presence. The Dolmans did so within a few hours and they were the first of many visitors who came to see the cardinal.

Only two other cardinals had been previously reported in Alberta. On May 22 and 23, 1987, Mr. Clay Hunt, 4 km S.W. of Water Valley, discovered a male cardinal at his feeder. A female cardinal stayed at the feeder of Caro and Mike Burrington in Edmonton from August 10 to October 20, 1989 and it was photographed, but birders were not alerted to its presence until after the bird had gone (Ross Dickson, personal communication). When word of the cardinal at the Hafichuk's feeder spread to the birding hotline of Calgary's Inglewood Bird Sanctuary and to members of the Lethbridge Naturalists' Society, many visitors made the trip to the Hafichuks' place at Moon River Estates, just south of Monarch (midway between Fort Macleod and Lethbridge). Victor recorded over thirty visitors, some of them more than once, and only four went away disappointed at not seeing the cardinal. Visitors came from the Lethbridge area, from Calgary and Edmonton and from as far away as Vermilion and St. Paul, and many of them obtained photographs.

Female Northern Cardinal Photo: Teresa Dolman

Its long stay at Moon River Estates allowed the Hafichuks ample opportunities to observe and take note of the bird's behaviour (soon it became known as Sussie, Marilyn's nickname for "surprise"). It fed on the ground or at the feeders for up to 20 minutes at a time if left alone, and as often as 6 times in one day (more often on cold days than warm). Several styles of feeders were available and it preferred a large (2 ft. x 3 ft.) flat tray feeder which Victor had subdivided into 1.5-inch-deep, 4 x 6 inch subdivisions. The divisions were built initially to prevent the seed (mainly sunflower and millet) from blowing away but it soon became obvious that it allowed each bird its own feeding territory so that many birds could feed simultaneously. Sussie appeared early each morning, before all other species except juncos, and was one of the last to feed in the late afternoon, except again for the juncos. She appeared to have a 4-inch "comfort circle" when feeding and was not intimidated by any other birds except blue jays. In contrast to the jays, chickadees and magpies, she never held seeds with her feet but always cracked them with her beak; her preference was for the sunflower seeds. The feeders were located near the windows of the house and she would sometimes be startled by movement at the windows, but not so often as were jays and house sparrows. She appeared to roost during the night in the conifers of the neighbour's yard. Her most frequent vocalization was a "tik" note but sometimes she broke into song, once at 4 am! As warmer weather came Victor gradually withdrew the seed at the feeders so that the cardinal came less and less often. It was last seen on March 30, 1992.

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Unusual Alberta Breeding Records

Blackpoll Warbler and Lark Sparrow

Edgar T. Jones

Few blackpoll warbler nests have been found in Alberta in spite of the fact that pairs have been observed during the breeding season. The nest that was recorded by Bob Gehlert and myself on June 23rd, 1992 might give some indication of why few nests are actually observed.

The first indication that this species could be nesting in Alberta came from Jim and Barbara Beck while they were participating in the Breeding Bird Survey during late May 1992. No less than three singing males had been seen or heard in a 3 to 5 km section off road in the southern region of the Swan Hills in north-central Alberta. This information was passed on to Bob Gehlert, a very keen naturalist and photographer, who is always interested in the more unusual warbler sightings in this province. Knowing of my interest and previous research on warblers through banding in Alberta, Bob contacted me and we decided to start our year by following up the reports from the Becks. I had reported to Bob on my banding at the end of May at Beaverhill Lake: this year yielded more blackpoll warblers than I have ever recorded/banded in spring banding trips, namely 100.

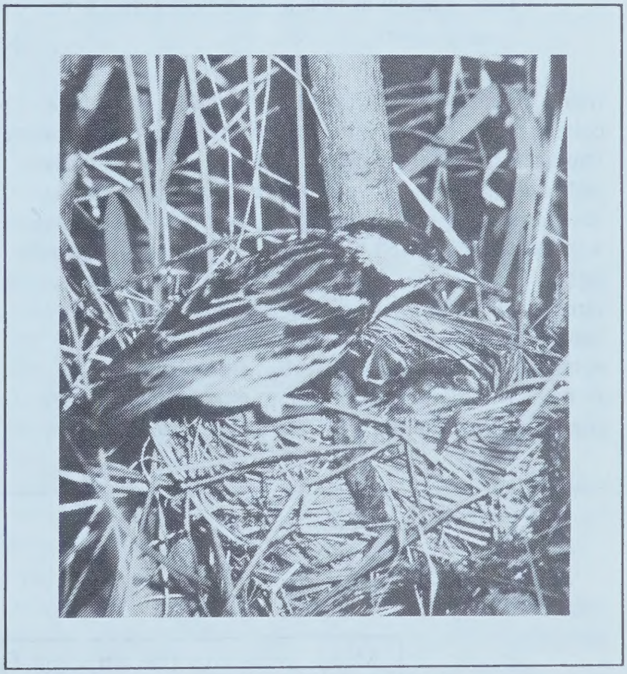
We camped the first night at a forestry campsite at Freeman Lake, not too far from the settlement of Swan Hills. In the morning we drove to the two closest areas where blackpolls had been reported. No indication of their presence in either area was found. It was decided to check out the third area, a mile or two to the south.

We arrived in this area about 10 am and immediately located an adult gray jay with at least one flying young in the vicinity. A moment or two later, both a male and female blackpoll warbler were observed, obviously agitated by the presence of the jays. Each of us took one bird for observation and concentrated on its movements. After the jays left, the female was seen dropping from a 10 m tamarack stump almost vertically into the very swampy, willow-choked area below. Both birds vanished completely and were not seen again. After scanning the flooded area for over an hour hoping for additional clues, the decision to search was made. Normal rubber boots were worn, which proved to be totally inadequate. Where the female was last seen turned out to be the nest location which was at the base of a willow approximately 20 m above water (35 cm deep). It is noteworthy that most references refer to blackpoll warblers nesting in small spruce. As the ground underfoot was very uneven in this beaver flooded area some holes dropped to 60 - 75 cm in depth.

The four pin-feathered young were fed every five to fifteen minutes by both adults. Our photographic blind, set up on a small mound in 45 cm of water did not appear to disturb the adults and pictures were obtained without difficulty.

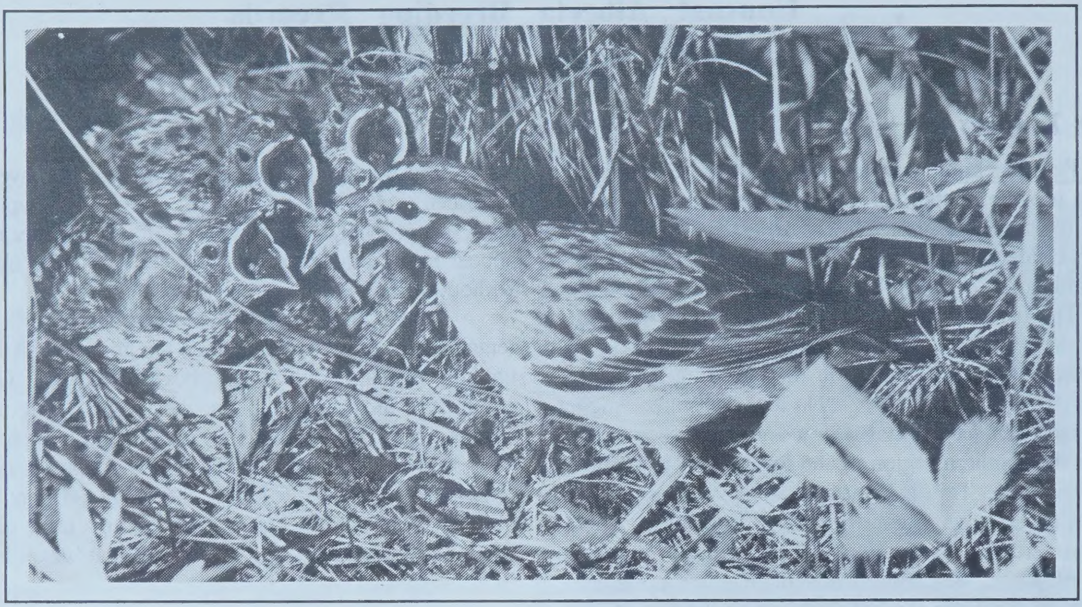
In summary, it was an exciting day but the fact remains, that without the help of the gray jays, it is unlikely that the adults would have been seen. Once the adults start feeding the young, they seldom sing and only on one occasion was the adult male heard very briefly.

Our second unusual discovery of the spring season happened while I was checking and banding my bluebird/swallow box line in the Hastings Lake area of central Alberta. Assisting me at the time was a long-time



Blackpoll warbler male at nest to feed young. Note that the nest is made of grasses and that there are no feathers in the nest lining.

Photo: R. E. Gehlert



Lark sparrow at nest to feed young and it was evident that the primary food items brought in were grasshoppers.

Photo: Edgar T. Jones

friend, John Klem. It was John who noticed the large, colourful sparrow and brought it to my attention. As I am familiar with lark sparrows from my visits to the plains and badlands over the years and had previously found several nests, it was only a matter of time before a nest was located quite well hidden at the base of a dead rose bush. The date was June 30th and the nest contained three pin-feathered young, several days away from leaving the nest. A blind was set up and John and I obtained pictures. Later that day, Bob also obtained pictures with both adults feeding, although the male, slightly more colourful than the female, was the more wary of the two. The young left the nest on the morning of July 3rd and moved out of the nest vicinity immediately.

Although there is the occasional record of this species having been seen in central Alberta, to my knowledge this is the only breeding record this far north. This finding coupled with the blackpoll nesting record, certainly put the spring of 1992 off to a great start.

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Many thanks to the Imperial Oil Ltd. for their Esso VIP grant. It enabled FAN volunteers to purchase a printer and soft ware, and a new light weight portable display unit.

These items were much appreciated by all those working on the Alberta Bird Atlas.

Mosquito, What Bird Ye?
Or
Ornithology in the Northern Boreal Forest

Phil Henderson

My wife, Benita, knew that our journey was inevitable! My persistent yearning to traverse the wilderness of Northern Canada had to be satisfied but when and where had not been decided. Eventually, my continued suggestions of holidays cutting firewood in northern Saskatchewan, spending a year in the wilds of northern British Columbia or setting up residence in a small northern town, took their toll. How appropriate, then, that a recent copy of Blue Jay, the journal of the Saskatchewan Natural History Society, contained a note requesting volunteers for the Alberta Bird Atlas Project. There still remained a few remote locations, where no census had yet been performed, and with only one year left for data collection, these areas would have to be covered now. Surprisingly, Benita was very receptive to the idea of volunteering and actually anticipated my proposal, having read the notice before I did. No doubt her eagerness was rooted not so much in her desire to actually go but in the hope that it would satisfy my cravings for the wild. After requesting information about the project, we received a letter from ''the remote areas coordinator'' for the Alberta Bird Atlas Project, outlining the project and listing the areas still unadopted. Strange how over the past three years these remaining areas had not been chosen! We applied for two areas in the extreme northwest corner of Alberta, in the heart of the northern boreal forest; we were accepted.

From the comfort of our Vancouver apartment, some 2,100 kilometres southwest of Rainbow Lake, one of our allocated areas, I rambled on to Benita in monologue ridiculously skewed with nostalgia and romanticism about the wet, swampy sphagnum carpet that spreads endlessly over the flat land of stunted black spruce. Small areas called hummocks, of higher, better drained soils dot the landscape like islands, supporting mixed stands of tall spruce, aspen and jack pine. This is a land of freedom, of beauty stripped bare, not endowed with any overbearing geographic wonder - no towering mountains, no cascading falls, and free of the heady narcissism and pretensions that plague the minds and manners of city folk.

We arrived at the Rainbow Lake forestry office on the evening of June 26th. Between radio calls from forestry officers in the field, the officer who was on dispatch duty introduced us to the forestry operation and provided us with some useful maps.

Two people had been assigned to directly assist us ''Bird Atlassers.'' Stuart Carter, whom we would meet the following morning, was to accompany us on our trip to Bistcho Lake and Steve Yackimec, whom we met that evening at the forestry office, would drive us through the maze of secondary gravel roads in the vicinity of the town of Rainbow Lake.

We spent that first evening in ''The Chateau,'' a bunkhouse made from trailers joined together, with ten bedrooms that opened into a large common area. It featured a lounge, with a couple of old chesterfields facing the television, and a dining room with a table and a set of chairs next to a weight lifting bench. The kitchen was separated by a wall with an empty doorframe and a ''come and get it'' window.

We awoke at 7:00 am, June 27th and joined three other bleary-eyed souls for a quick coffee. Ernie, our appointed driver, was a big, heavy fellow with a quiet confidence and, fortunately, a good sense of humour. I could not help wondering how much he begrudged our presence and the imposition on his good night's sleep. Tracy, the cook, was a friendly, strapping woman whose rough edges were acquired from, and necessary for, working in camps full of hungry men. Dave, dressed in bright orange coveralls, was an amiable, but wild, looking character with a wealth of corny jokes and a head of hair like an African bushman. Breakfast broke up with Ernie disappearing outside, Dave disappearing, probably back to bed to lay his hangover to rest, and Tracy tending to the dishes. Benita and I began to haul our supplies out to the truck. Outside Ernie attempted to activate an unwilling four wheel drive Suburban van, a discard from some southern forestry office that had already driven the life out of it. Ernie had somehow managed to coax it a few feet but I failed to see how, for each time we emerged from the trailer with more supplies, the vehicle only coughed and sputtered. Ernie kept remarkably calm before eventually giving in to this hapless grunting monster and choosing a smaller two-wheel drive pick-up truck. When Stuart arrived, we loaded our supplies into the box of the pick-up and started on our assignment.

We left the paved highway that runs east-west between Rainbow Lake and High Level, at a point about 40 km east of the town of Rainbow Lake. From here we travelled north, following a gravel road that took us through the large Hay-Zama Lake Indian reserve, in the Land of the Dene-Deh. The town of Assumption, within the reserve, is flat and rather barren. Houses were distant from one another and under the continuous siege of the forest, wild grasses and shrubs. The houses looked as though they had been placed there against their will! Beside many of the houses were log pole tripods - like skeletal tepees - used for hanging and preparing killed animals, and an assortment of horses grazed on the tall grasses in the schoolyard.

There was little activity in Assumption, save a small boy on his bicycle and a woman walking along the road. An extremely high rate of unemployment (80%) and a high incidence of alcoholism and its accompanying social horrors conspire to undermine and destroy any potential community cohesion and vitality. Many of the men take jobs in the forest service during the summer months fighting fires, a job at which they excel. Despite this bleak pecuniary and social situation, the Dene-Deh have a strong sense of pride reflected in their desire to keep alive both their language and their rich culture.

North of Assumption the reserve is marked by the occasional home off the side of the road but these dwellings soon submit to the forest and the land that belongs to these peoples.

Now Ernie's navigational and driving skills were put to the test. He always seemed to know exactly where he was going, choosing the left or right fork in the road, many of them unmarked, some labelled with the name of oil companies or nearby towns, such as Ft. Nelson, B.C., 220 kilometres away, as the raven flies, and God knows how many along these meandering trails. Rain expelled any possible monotony, turning the hard packed surface into a layer of slick mud to which no tires could adhere. The truck developed a demented will of its own, bent on driving sideways and veering toward the ditch. Ernie and Stuart related tales of foresters and swamps, and ditches that showed no mercy.

Having complete disregard for the truck's unsteadiness and demonstrating absolute confidence in Ernie's driving skills, or perhaps blinded by his need to catch some sleep, Stuart slid open the window on the back of the cab and pulled himself through to the open box of the pickup. I don't quite know how he managed sleep but I suspect it was laden with dreams of two inept Bird Atlassers wandering off after a ''good bird,'' leaving the campfire blazing, stumbling over mobile black stumps that bawled for their mother and all the while trying to focus their binoculars on some tiny feathered creature.

We reached the ''airstrip'' - a muddy clearing with a small metal shack - at the same time as the helicopter arrived. In between splashing mosquito repellent on our exposed skin, Benita and I introduced ourselves to Steve Blanton, a senior forester officer, pleased to finally meet him, and grateful to him (I wondered why as the insects began to swarm!) for arranging this trip. Enthusiastically, Steve informed us that he had found a suitable spot to set up camp on the Petitot River which flows southward from Bistcho Lake before bending west into British Columbia and north again where it drains into the great Mackenzie River.

This was my wife's first flight in a helicopter and she was quite excited and not disappointed, as we slowly lifted off and more of the surrounding country came into view. In the air, one is immediately impressed by the flatness of the land and the sense of age and lifelessness. The dominant features include the sparse and contorted black spruce; shallow lakes with crooked, half submerged silver poles - ghosts of drowned black spruce - and oval patches of yellow-green sphagnum between the scattered hummocks of aspen, spruce and jack pine, the oases of this land. Man's presence is carved through the landscape in every direction; seismic lines, pushed through in the winter for oil and gas exploration, stretch to the horizon and disappear into a lake then reappear directly opposite as if shot right through the lake. Paradoxically, many of the animal trails run along these cutlines, but where all these animals were I could not see. All that we saw were their trails, beaver dams, ducks upon the lakes and black terns and Franklin's gulls zig-zagging over the surface. Except for the industrious beaver, all signs of wildlife suggested transience.

Heading north toward Bistcho Lake we flew over the site that Steve had chosen for our camp. It was at an expanded part of a seismic line beside the Petitot River, about nine kilometres south of Bistcho Lake. Here another unnamed river (we referred to it as Little Petitot) drains into the Petitot River. We followed the Petitot north to Bistcho Lake in search of a family of trumpeter swans that Steve had spotted previously on the west end of the lake. Trumpeter swans are not common in this area and there had been no records of breeding pairs on Bistcho Lake. About a kilometre south of Bistcho Lake the river widened considerably and in this area birds were very abundant. We saw bald eagles, including a nest with one young, an osprey, and a great number of ducks. The majority comprised a large group of about 50 birds, most probably common goldeneyes or common mergansers. However, these were too distant for confirmation: only their bold black and white dorsal patterns were evident. We found the trumpeter swans about 100 metres off the lake shore - two adults with their five cygnets sandwiched tightly between them, presumably in an effort to protect them from our noisy flying craft. Wisely, the pilot maintained his distance and made only two passes round the birds so as not to disturb them excessively. Previous records for trumpeter swans on Bistcho Lake were of non-breeding individuals recorded by W. Bruce McGillvray in 1987. The objective of this short trip realized, the confirmation of the trumpeters, we flew back to our new camp. On the way we saw, in the swampy margin of the lake, a huge bull moose feeding on the vegetation and, about a kilometre south of it, a cow and calf trotting excitedly along the edge, alarmed by our presence. Strange that we had flown some 90 kilometres from the airstrip and in all that country saw only signs of animals and here within a few kilometres we saw so much.

At our camp we unloaded our equipment then further assessed the suitability of the spot; it seemed ideal. It was in a large clearing that had likely been a seismic camp in the past, a hypothesis supported by the presence of a rusting leaf spring abandoned at the edge of the clearing. We were only about 100 meters east of the Petitot river, on firm ground, among a good stand of aspen and spruce. To the east the forest rapidly degenerated into black spruce bog known as muskeg. As we stood around discussing our plans and making arrangements for pickup three days hence, flying insects, previously non-existent, mounted their attack. In a thoughtful gesture, Steve cut a leafy branch from a small bush and presented it to Benita who, following Steve's instructions, and ceaseless demonstration, put it to work immediately, swishing it back and forth across her face and over her shoulders. In a short time she became an expert, and this swishing action became as natural and necessary as breathing. Meanwhile, Stuart had chosen a spot for his lean-to and gathered black spruce poles for the framework to which he could later affix a sheet of plastic.

We bid farewell to Steve and the pilot and secured our equipment as the helicopter lifted off. This was the moment I had been looking forward to - to be left in the wilderness with no roads, no buildings, no people. Only the insects in their hundreds, thousands, hundreds of thousands, they returned in hoards, perhaps more determined after having been blown clear by the helicopter. Mosquitoes, black, horse, and deer flies and numerous variations of the pestiferous turd-loving house fly which percussed with its many feet upon our skin perhaps looking for an abscess into which to deposit its eggs!

While Benita and I set up our tent, Stuart finished his lean-to and began preparing our kitchen area about eighty feet from our sleeping shelters. He fashioned a table and pot holder with wire and spruce poles, and dug a fire pit in the sphagnum moss all with surprising speed and obvious skill. As the insects swarmed around us we added more layers of "mosquito dope" to our skin and clothes. Insect repellent was something we had plenty of, in many different brands and forms: Avon Skin So Soft - a moisturizing lotion not marketed as an insect repellent but said to be effective, a natural citronella based variety that had the pleasing scent of lemons, and numerous other brand names with 95% DEET, a dubious but effective chemical repellent. We soon abandoned all hope with the milder, dermatologically harmless varieties, opting for the maximum strength solutions with 95% DEET, all the while trying to ignore its tendency to melt plastic and nylon and its cumulative toxicity that gives rise to any number of symptoms whose common trait is discomfort. After setting up camp, we consumed a little food in the sanctuary provided by the smoke from our fire, the best insect repellent of them all. Despite the fact that the sky was clear and it was at least 25 degrees Celsius, we wore long pants, long sleeved shirts, thick socks, and chased the smoke around the fire as the wind blew it away from us, withdrawing only briefly to relieve our stinging eyes.

With full bellies and with smoky clothes and flesh, we braved the clean, mosquito laden air on our first census foray, following the seismic line east from camp. With each step we gathered more mosquitoes and flies. They swarmed in a thick, noisy cloud around our heads, just waiting for a tender patch of unprotected, untreated flesh. So skillfully did the mosquito work her proboscis through that tough outer layer of epidermis to reach the warm, tender, blood rich layer beneath. Lost in sweet sanguineous dreams, her "stomach" distended with blood, she became an easy and welcome target for a fast hand. So numerous were they, it was as though these creatures were born from our skin and were simply returning home, or returning for a legitimate feed. Fortunately, one eventually develops an attitude that seems to temper the insect's voracity. Eventually!

Benita and Stuart did not share my enthusiasm as I stopped to watch a yellow-rumped warbler perched in a small aspen along the cutline and this foray turned out to be much shorter than planned. We retreated to camp, swatting insects and trying to ignore their buzzing din, the greatest curse of their presence. Little was said on our return and Benita lingered behind Stuart and I, completely dejected, wondering just what kind of hell she had been inveigled into. Previous experience had led her to believe that suffering was neither the purpose, nor goal of vacations. Hitherto, no amount of stupid jokes or stories could elicit a smile on her usually serene face and I too became a little dispirited from pangs of guilt for having brought her here. Stuart kindly offered to radio the forestry base camp and have the helicopter retrieve us sooner but I suggested we wait to see how things were the following day, hoping that her spirit would be rejuvenated with sleep.

I must note that it is neither through machismo nor a biased memory that I depict Stuart and myself as suffering less. We suffered; the difference being that Stuart, living in this area, had experienced the insects and knew what to expect and I, having lived ten years in Ft.

Nelson was similarly prepared. Without such mental indoctrination these insects presented a major force.

The next day we awoke at 5:30 am, the sun bright upon the tent, heating its interior. I took a stroll down to the river to fetch some water and it was quite surprising how wet the ground was. The grasses and shrubs were thick with dew, moisture that had been absent in the dry heat of yesterday's sun. From the clearing of tall sedge I spotted two male and one female common mergansers together on the river about 75 meters downstream at the point where the Little Petitot flows into the Petitot. Alder and willow grew thick along the river's edge obscuring the bank, their branches drooping low over the water. Were it not for the sparsely treed muskeg surroundings, one could easily have mistaken this for a river in the tropics. From within this dense foliage an alder flycatcher sang, the only one we observed in the Bistcho Lake area. Back at camp, I filtered the water for use in coffee and for washing. This removes any sediment, of which their was little, and most importantly, removes Giardia cysts, a cause of beaver fever, a disease that can be very persistent and as debilitating as the Chronic Fatigue Syndrome. Stuart had the fire going and a couple a mosquito coils burning, discharging their lethal smoke upwards in serpentine plumes.

Benita emerged on this morning a new person, covered with mosquito repellent and enthusiastic about our itinerary. The map indicated a beaver dam three kilometres away. The plan was to travel two kilometres east from the camp along the seismic line, then bear north for another kilometre on an intersecting seismic line that crossed the beaver pond. About 8:00 am we headed out, liberally doused with mosquito dope, Benita with her leafy branch, busy swishing bugs away and Stuart carrying a sleeping-bag sized mosquito net which he soon draped over himself. Henceforth, in such guise, he was called the ''Swamp Thing.''

On the ground one ceases to be simply an observer; one becomes a participant. The trees look bigger, denser and the flatness, which from the air looked so conducive to walking, becomes one great obstruction. At every step one sinks at least six inches into the sphagnum, or two feet into the water if one is unlucky. Each step must be calculated to minimize sinkage into the water soaked sphagnum and particularly swampy areas must be skirted wherever possible, or traversed by long strides between clumps of vegetation. All these hardships of travel help to take one's mind off the constant din of mosquitoes and flies, as they relentlessly pursue exposed flesh. One is clearly in trouble without some form of distraction. I believe I had an advantage over Benita and Stuart in that I possessed an indomitable enthusiasm for investigating the birds of the area. This allowed me to remove the pestiferous cloud from my vision and the constant buzzing from my ears. A male palm warbler sang from atop a stunted black spruce; in the distance I heard a Lincoln's sparrow, a flute-like Swainson's sandpiper, aptly named, explored a small pond on the seismic line while a male dark-eyed junco, cousin to the sparrow, sang his rapid trill from nearby scraggly spruce. A ruby-crowned kinglet sang from a spruce, his red cap like a dab of bright paint atop his head.

After traipsing across the wet, unstable sphagnum substrate for two hours, the hummock we approached was a welcome sight. As we neared this hummock I realized that just on the other side of it was the beaver dam; I quickened my pace. These hummocks are ornithological candy jars, as are all the lakes and ponds of the area. One never knows just what one will discover. We were not disappointed. Amongst the small aspen alongside the cutline a pair of yellow warblers fluttered between branches, the male's red-streaked yellow breast beautiful against the background of green trembling foliage. The leaves of the trembling or quaking aspen *(Populus tremuloides)* as the common and specific names imply, tremble or shake in a breeze, flashing alternately their silvery underside and their green topside, bringing the whole tree to life. In the surrounding area we heard and saw bohemian waxwings; an olive-sided flycatcher repeatedly commanding us to ''whip three beers''' the common and excellent songster, the white-throated sparrow, a northern flicker, an unspecialized woodpecker, and the handsome black-capped, yellow and green Wilson's warbler. A beaver glided through the water just beyond the sedge and sedge and shrub communities that bordered the pond. Near the middle of the pond, not too far from the dam was the beaver's lodge, a huge mound of sticks rising about four feet above the water. An eastern kingbird, a large distinctive flycatcher whose latin name, *Tyrannus tyrannus*, reflects its aggressive disposition, sat on a pole protruding from the lodge. From this perch, it watched patiently for flying insects and, in typical flycatcher fashion, took short, quick flights for its prey, then returned to its perch to continue surveillance. Larger flying objects are given equal attention: any passing hawk, raven or other large bird is attacked immediately and relentlessly until driven off. It has even been known to attack a low flying airplane crossing its territory! For this bird I hold a special fascination, one based on its ability to maintain such a lively and focussed temperament in one of the most formidable habitats on the continent. It is a species which favours these areas of ponds and bogs. With no solid substrate and a forest of crooked poles of drowned black spruce, this area looks like a boreal graveyard and these endless miles of scraggly, stunted black spruce and tamarack in the bog suggest a semiarboreal hell to which these birds have been sentenced. Hell it is not, for many species thrive here, although species density and diversity are less than in the hummocks, edges and the areas with the larger tracts of taller stands.

While Stuart gave up looking and sat beneath his mosquito net, reading a novel, Benita and I combed the area until we were certain we had recorded all that was present or all that willingly submitted to our scrutiny. Further species observed included a male blue-winged teal, a small, colourful "dabbling" duck, a pair of lesser scaups and two female American wigeon. Following the same route back we saw most of what we had already identified earlier. One noteworthy exception was a LeConte's sparrow, a buff-coloured sparrow which is known to occur in the general area but is not seen frequently. This little fellow was very cooperative: he stayed nearby, hopping between three and four foot spruce.

Benita took to joining Stuart within the protection of the mosquito net whenever I stopped to watch a particular bird. Abandoned by wife and forester, left in the open to feed these buzzing masses, I had my divertissement, the birds, and for this reason I suffered little. Benita and Stuart soon gave up this cooperative mosquito net strategy when it became evident they were trapping as many insects as were excluded! Henceforth it was back to Benita's swishing of the branch and Stuart taking short sprints to clear away the bugs before quickly enveloping himself once again in the net. The 'Swamp Thing' sat quietly reading his book which didn't once make even the most vague or symbolic reference to mosquitoes. Each with our own strategy, we managed the situation well, and in this manner made it back to camp.

After lunch we sat around, attempting to relax during this time of leisure. Although we were all very tired it was impossible to sleep. The heat and the insects made sure of that. We sat next to the fire, burning mosquito coils, actively pursuing a variety of forms of relaxation. Stuart lay on his air mattress with the mosquito net covering him from head to foot, reading his book and drifting into sleep. We were all suddenly jarred from our insect, heat and fatigue induced stupor when through the forest came the loud crashing of some huge animal that sounded rather mad. Huge it was but mad it was not. The cow moose broke into a clearing about forty feet from camp, took a good look at us and continued crashing its way through the trees. Twice after that we heard the same noise, probably the same old girl a little perturbed perhaps that these awkward, smelly bipeds had set up camp in her favouite browse.

I brought plenty of reading material on this trip. Nothing better than a book to counter boredom and hinder panic in a survival situation. Of course, I would never read them all but deemed them all necessary. It was impossible to concentrate diligently on any subject without being forced back to the reality of the insects which continued to bite, land on, and crash into, what little skin remained exposed. I alternated between chatting, listening to the birds of the forest, reading and consolidating my field notes, and perusing field guides and ornithological literature. Other material included Conversations with Professor Y, by Louis Ferdinand Celine, How to Shit in the Woods, by Kathleen Meyer, a befitting gift from my Peruvian sister-in-law, and copies of The Spectator and Punch generously and prudently provided by an associate at work. I can honestly state that The Spectator is as well suited for reading in the northern boreal forest of Canada as it is whilst laying on a chesterfield, sitting at a table, or while sipping scotch and lounging on plush leather chairs in a society club or someone's private library. Because of the numerous insects a certain inter-page transformation occurred and I suspect that when I returned these magazines, their contents were even weightier and juicier than before!

The following morning the helicopter was to fly us to our next location which Steve and the pilot had surveyed. We chose to leave a day earlier than planned, realizing we could not cover much more area here, given the difficulty of travelling in this country. As was the necessary custom before retiring, we lit a mosquito coil and allowed it to burn for about fifteen minutes inside the tent. This effectively killed or stupefied the population of deer, horse, house and black flies and the mosquitoes. They dropped onto the floor and sleeping bags where they buzzed around in a futile attempt to shake off the oncoming darkness. It was about 12:30 when we entered the tent, the sun having just dropped below the horizon. A sharply delineated band of clouds was forming north of us over Bistcho Lake. In anticipation of rain, Stuart reinforced his plastic lean-to with the vinyl tarpaulin from the kitchen shelter. I crawled into my sleeping bag, exhausted after a hard day of hiking and attempted to sleep, while Benita went about making certain that the remaining flies, some still buzzing around the top of the tent, were dead. It seemed evident to me that these creatures were now a little too concerned with the horrifying effect of these toxic fumes to worry much about eating. In their state it was possible that they were incapable of keeping their food down anyway; well, perhaps not. I watched a fly nibble on the freshly squashed and oozing remains of a kindred creature, perhaps a cousin, an uncle or a brother. An odd way to pay its respects. I could not help but draw a vague comparison to our own situation, our vulnerability. With all flies and mosquitoes exterminated, Benita finally retired. Now we were safe from the possibility of a dazed insect falling into our gaping mouths.

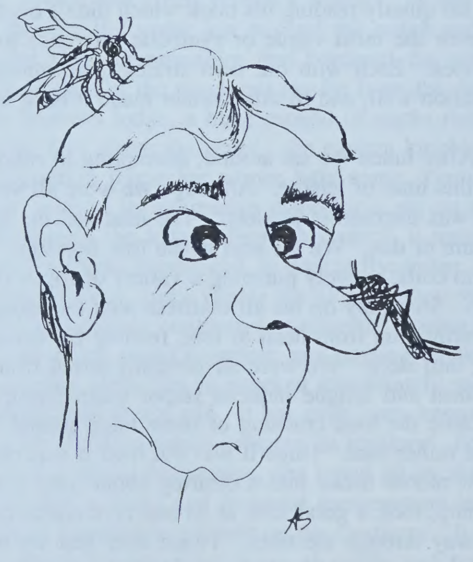
It was probably less than half an hour later that the rain began. It was dark now, much darker than it should have been for this time of the year where complete darkness is never experienced. The pounding of heavy rain upon the thin nylon shell startled us both from our sleep like a slap across the face. The lightning began in huge blinding flashes and the thunder that followed seemed to shake the ground. I zipped up all the flaps. The rain beat down noisily onto the surrounding trees, shrubs and the ground on which we rested.

It was impossible to sleep. The rain continued with little respite of its furious tempo, and so our fears grew. I began to doubt the tent's ability to withstand the beating from such heavy drops, like a solid sheet of liquid bullets. I rehearsed an emergency plan. I made mental notes of the whereabouts of our rain gear and pictured ourselves donning them frantically and seeking shelter in the forest, waiting, wet and uncomfortable for hours until the storm lifted and the helicopter could rescue us. The lightning continued like someone arc-welding outside our tent and the thunder followed, like bombs being dropped nearby. Occasionally I checked the floor for leaks. There was a little water, mostly condensate, and no pooling inside but I could feel it on the outside against the nylon, like poking a finger into a water bed. Fear bred imagined predicaments, the most persistent being the failure of the tent and a miserable and long wait in the forest. Such rainfalls could last for a week. Meanwhile, poor Stuart was out there in a lean-to about one hundred feet away, well beyond hearing range. Maybe he'd been barbecued by a lightning bolt or flooded out - we'd have to wait until morning to see. I wished that we had that tarpaulin to throw over our tent for extra protection. All night long we lay there with little spurts of hope coming as the rain eased slightly - at most for about 30 seconds - and sleep came and went with every lightning strike. The flashes and thunder claps raced right through our nerves tearing at the fibres and scorching the synapses. As if I hadn't dreamed up enough scenarios of terror, Benita wondered aloud if lightning would strike a tree and it would crash down upon us!

At about 8:30 am, that which I began to believe would not occur, did. The storm broke, the rain slowed to a drizzle, and we emerged from the tent to assess the damage. The tent, pitched on hard ground, lay in about two inches of water. We met Stuart - neither charred nor drowned - at our former kitchen area. He bore a huge grin as did Benita and I, all greatly relieved that it was finally beginning to break and thankful that we has survived without any major incident. If the weather held, and all signs indicated it would, the helicopter would get us the hell out of here in about three hours. We gathered our supplies together, took down the tent and left Stuart's lean-to intact in case we required its shelter. We cancelled the short trip planned for the area just south of the camp along the Little Petitot River. I had expected the Petitot to have flooded the low lying sedge clearing where we gathered our water, but it appeared normal and calm, quite surprising given the storm's intensity. While waiting for the helicopter Stuart practised his skill at mosquito torching - igniting the spray of the mosquito repellent and torching the attacking insects. It was most rewarding to see these creatures disappear.

The helicopter eventually arrived about 11:30 am. Stuart took down his shelter and after a brief chat with the pilot we loaded everything and took off to our next destination, a cabin on the south shore of Bistcho Lake about twenty-seven kilometres east. We flew directly over the beaver dam we had hiked to the previous day. It looked so small and all I remembered was that which I couldn't see: the bohemian waxwing in a dead aspen, the swamp sparrow along the water's edge and that eastern kingbird sitting on the lodge; it was a good thing we weren't flying any lower! I heard neither the rotors of the helicopter nor the continual chatter over the headsets - only the olive-sided flycatcher, the white-throated sparrow, the voices of Benita and Stuart, the rustling of leaves on the shimmering aspen and a million buzzing insects; I was thankful that I was there no longer.

I know that sometime I shall return.



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Baillie Birdathon, May 30, 1992

Gerry Lunn

Given what the weatherman had been promising, I'd been expecting to step out into rain when I got up at 5:30 am on the morning of Saturday May 30, I was very pleasantly surprised, however, to start my birdathon in beautiful sunshine at Sir Winston Churchill Provincial Park on Lac La Biche. I wasn't surrounded by birdsong as I'd hoped, but I had a feeling it would change. Frustratingly, one of the first warblers I heard I couldn't see as it kept moving off deeper into the spruce. However, within a short time I had heard and seen magnolia warbler, purple finch, red-eyed vireo and American redstart among others.

One of the most unexpected birds I found was a lone Pacific loon, bill tucked into its wing feathers, bobbing a light chop on the lake. White-winged scoters flew by in the background, while a couple of Forster's terns fished the shallows (with great success), along the shore below me.

Moving on to the start of the Long Point Trail, I saw many more redstarts, mostly first-year males with their salmon-coloured side patches, singing merrily from the understory. In the aspen canopy, a rose-breasted grosbeak was also singing, the first of several I would hear this day. My jaunt to the Point and back turned up a good number of warblers, again mostly redstarts, but also Canada warblers, a few common yellowthroats, two palm warblers (tails constantly wagging as they foraged for insects among the spruce branches), one each of mourning, orange-crowned and blackpoll warblers, and a pair of Cape May warblers.

As it was mid-morning and I still had lots of ground to cover, I decided to walk the Boardwalk Trail and then return to our campsite to pack up. Very shortly after entering the mature spruce stand, I heard and saw boreal and black-capped chickadees, red-breasted nuthatches and ruby-crowned kinglets. Then, faintly at first, the odd, atonal song of a black-throated green warbler reached my ears from high in the spruce. Returning to the campsite along the road, I was treated to the sight of a pair of western tanagers and a solitary vireo (and, until I saw them, I thought for a moment the song of one was the song of the other!). Then, the unfamiliar song of a warbler could be heard from nearby. It took me a few minutes of searching before my eye found the brown-and-white songster climbing the trunk of a spruce - a brown creeper, not a warbler after all!

On our way out of the park, we stopped at the access road to the woodpile, traditionally a great spot for warblers, especially at the low, wet spot in the woods nearby. Although I heard and saw Blackburnian, black-throated green and Cape May warblers, there were far fewer species than I'd hoped for (related perhaps to the very dry conditions evident throughout the area?). A brief stop at the isthmus beyond the park gate enabled us to get very close views of dozens of western grebes -- paired off and "cr-r-r-r-recking" to one another.

Within an hour or so, we were pulling into a vacant campsite in B Loop of Long Lake Provincial Park, the site where in 1989 I had turned up 111 species for the Alberta Breeding Bird Atlas. Although I didn't quite have the same luck on this day, I did manage to add 13 new species to my day's list. I chose to trek off through the woods along game trails that would take me in a large loop through a variety of habitat. Northern orioles were in abundance, especially first-year males in their sometimes scruffy-looking plumage. On a few of the beaver ponds I encountered, ring-necked duck, blue-winged and green-winged teal, and several buffleheads were found with swamp sparrows singing their sweet and slow trill from the marshy shore.

Although I found relatively fresh black bear scat on a few of the trails, I didn't see any of the animals themselves, unlike my experience of three years ago. Regretfully, I found neither the great blue heron colony nor the osprey nest occupied this year. What may have happened to them all, in this relatively undisturbed area, I was unable to guess.

By the time I returned to the van, I'd added to my list northern waterthrush, yellow-bellied sapsucker, and oliver-sided flycatcher (identified by its distinctive demand "Quick! Three Beers!" from high atop a spruce). But I had spent far more time than I should have here and decided that Elk Island would have to be missed in order to get on to Beaverhill Lake. The clouds were gathering and I'd been sprinkled on twice at Long Lake -- hopefully the weather wouldn't completely close in.

Birding enroute, we saw a number of Swainson's hawks and American kestrel and a cloud of cliff swallows under a bridge over the North Saskatchewan River. It's a lucky thing we stopped for gas in Lamont because it was there that I picked up the lone house sparrow and solitary rock dove of the entire day!

As we pulled to a stop on the west side of Beaverhill Lake at about 7:00 pm, I knew I'd counted 95 species up to that point. Would I reach 100? Oh surely, but my guess was I'd end the day with 111 species, my wife with greater faith in my abilities predicted 116. We would soon know.

It was encouraging, to say the least, to see a red-tailed hawk being chased and harrassed by one of two short-eared owls, which in turn was set upon by a most vocal willet, the commotion of which put up a marbled godwit -- all before I set foot outside the van. As I walked to the shore, Franklin's gulls drifted over in twos and threes to alight in the grasses to my right, while western meadowlarks seranaded me to my left. My heart sank as I scanned the shore, for other than a couple of black-bellied plovers, there were no shorebirds in sight. Before too long, however, a few sanderling flew in followed by a couple of red knots, semipalmated sandpipers, short-billed dowitchers and American avocets. It was obvious that the bulk of the northern shorebirds had moved through. However, numerous other waterbirds were present, including dozens of northern shovelers, several redhead, a few eared grebes and numerous pairs of Wilson's phalaropes performing gaceful pirouettes as they fed out on the water.

We carried on to the south shore and the Beaverhill Natural Area where in the hastening dusk we picked up several bobolink from Kallal Meadow on the way. From the marshlands surrounding Lister Lake I was able to hear, but not see, pied-billed grebes, American bittern, and several soras. Thinking I might find, at least by song, a vesper sparrow or two from some clearings along the way, I hiked out Park Lane. No luck with the vespers but the barely audible thumping of a ruffed grouse greeted me instead. Cutting through to the edge of the sedge-and-rush wetland halfway to the weir, I stopped to listen to a very odd sound. It sounded as though two stones were being knocked together "tic-tic tic-tic-tic tic-tic". It took but a few seconds for it to dawn on me with some excitement that I was listening to a yellow rail, the seldom heard and rarely seen relative of the sora and coot. Things were looking up, and it was only 8:30!

A few common nighthawks buzzed overhead as I approached the weir. There was a cacophany of sound from the marshlands to my right as red-winged and yellow-headed blackbirds declared territorial boundaries to anyone who would pay attention. The scolding chatter of marsh wrens could be heard from the tangle of cattails in the slough to my left.

As I reached the weir, one of the first birds to greet my eyes was a treat -- a lone black-crowned night-heron standing motionless, surprisingly in the middle of the bay. I scanned all the waterfowl within sight through my scope hoping to add to the 15 species tallied thus far. Something about a couple of small ducks close to the night-heron (who had now been joined by two companions) made me take a closer look. There, dabbling for invertebrates in the shallows, were two cinnamon teal, their bodies glowing a deep reddish brown in the setting sun.

Eventually I had to leave, but not before a "squadron" of 16 American white pelicans drifted in from the north to land on Lister Lake ahead of me. Several Le Conte's sparrows could be heard from the willows near the wetland but not one made an appearance. Halfway back to the car, I noticed a flock of nine black-crowned night-heron -- that's right, I did say a flock of those exotic looking herons -- flying over Lister Lake eventually to land somewhere in the expanse of cattails to the south.

My original plan had been to finish my birdathon by hiking the trails of Miquelon Lake Provincial Park. However, driving away from Beaverhill at 10:00 pm, I suddenly realized just how exhausted I was feeling. Besides, by the time I reached Miquelon, it would be too dark to see and most reasonable birds (and birders) would have retired for the night. You can imagine then how surprised and pleased I was when, atop a telephone pole and silhouetted against the last remnants of light in the western sky, I saw a great horned owl. It was a satisfying way to close out what had been a most enjoyable day.

How did I do, you ask? Well, my previous "day's best" had been 119 species and on this day I topped that by 10 -- in other words, 129 species. It's not an Alberta record by any means (which I understand is just in excess of 140 species in one day) but it's one day of birding I'll remember for some time to come.

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Announcements

Alberta Environmental Directory

Now available from the Alberta Environmental Network, the fifth edition of the Alberta Environmental Directory, an extensively cross-indexed listing of over 450 organizations and agencies involved in environmental issues, services and activities in Alberta. Detailed listings give complete contact information, as well as other information. To order yours, contact The Pembina Institute, Box 7558, Drayton Valley, Alberta T0E 0M0, phone (403)542-6272. Rates: companies/government/ libraries - $25.00 (purchase orders and invoice requests accepted), individuals or non-profit voluntary organizations $15.00 (prepaid only).

* * * * * * * * *

The Toronto Ornithological Club has produced **"Birder Extraordinaire":** The Life and Legacy of James L. Baillie (1904-1970) a book describing the life of one of Canada's most famous birders. Copies are available at the pre-publication rate of $10.00 plus $2.60 for postage and handling. Send a cheque to Jim Griffith at 560 Blythwood Road, Toronto, Ontario M4N 1B5.

* * * * * * * * *

The Banff Centre for Management offers courses in conflict resolution of interest to those playing a role in public participation programs or as interveners. Contact the Banff Centre at 762-6133 or Box 1020, Station 45, Banff, Alberta T0L 0C0 for more information on the two seminars offered this fall and winter.

* * * * * * * * *

Ecotourism: Developing an Action Strategy is a three-day seminar presented by the Banff Centre for Management. Contact the Banff Centre at the address above or at 762-7327 for more information.

* * * * * * * * *

The Bamfield Marine Station offers courses and workshops on marine ecology. Some of their up-coming programs include:

- Artistic Inspiration and the Marine Environment
- Birds of the Sea and Shore
- Marine Biology Family Weekend
- Archaeology and Ethnography of the West Coast Peoples
- Maritime History and Shipwrecks of Barkley Sound

For more information, contact Adrienne Mason at the Station, Bamfield, B.C. V0R 1B0, or call (604)728-3301.

Book Review

The Kid's Nature Book

Susan Milord, 160 pages, Williamson Publishing, $12.95.

The Kid's Nature Book is an excellent hands-on nature book. There is an absolute tonne of information but it is presented in easy to digest write-ups and activities. Even as a trained naturalist-interpreter I was amazed at the number of ideas, projects, crafts and experiments presented. And yes, I learned a few things along the way!

The format is wonderful - something for every day, laid out calendar style, in weekly themes that loosely follow occurrences in the natural world.

One of our favourite weeks is that of April 8 - 14, all about rain and rainbows. We made rain gauges, rain paintings and an origami circular rainbow for grandma!

Susan Milord is a wonderful graphic artist. Her sketches, as well as some from other artists, are sprinkled liberally throughout the book, and serve to break up what could have been a lot of writing. Unfortunately there were no photographs to aid in the identification of unfamiliar species.

No book, even a Parent's Choice Award Winner such as this one is perfect, though. At times, especially during the overly long intoduction, I wasn't sure if it was meant to be read by me or my older children. I found too that the book emphasized collecting whereas I prefer to observe.

The Appendices at the end of the book provide a host of information sources. They also list the birds, flowers, etc. of all 50 states; no Canadian information is supplied.

The book's write-up states its intended audience as 1-10 year old level. It is also light on simple experiments and crafts for the preschool set.

Overall I was impressed with the Kid's Nature Book. I recommend it for active families, especially those with curious pre-teens and young teens.

Leslie Pringle

BIRDQUEST

Education program for all ages, contact FAN Environmental Education Committee
Phone: 453-8629

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CONTENTS

President's Page 1

Naturalist Hotspots in the Grande Prairie Area, Margot Hervieux 2

Alberta's Watchable Wildlife Program,Harry Stelfox 4

A Good Day, Philip Boxton 7

Chicken-of-the-Woods, Bill Richards 8

Alberta Releases Wolf Management Plan, Dick Dekker 10

Status of Woodland Caribou, Bob Gainer 12

A Ferruginous Hawk in the Rockies, Karl Grantmyre 14

Small Protected Areas Stewardship Course, Don Stiles & Derek Johnson 15

Birding Help, Jim Robertson 17

Announcements 19

Book Review 20

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, FAN, Box 1472, Edmonton, AB T5J 2N5.
May Species Count-Plants; July 15, J. Derek Johnson, Northern Forestry Centre, 5420 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

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The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(b) To encourage among all albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(c) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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PRESIDENT'S PAGE

R. Barry Jenkins

With suitable fanfare in both Edmonton and Calgary *"The Atlas of Breeding Birds of Alberta"* has been released and you should have received your copy (if you ordered one). If you want one, or want another one (Christmas presents?) you can get the *Atlas* at almost any book store in the province. I am very happy with the results; it is not only a beautiful book but will be very helpful for anyone interested in birding in Alberta.

The database upon which the book was based is a "snapshot" of the current distribution of birds in Alberta, as complete and accurate as the hundreds of people who participated in the project could make it. I knew that the data base would not be complete but did not really believe it, not with the thousands of hours of surveys that had been carried out. Mother Nature immediately showed us how little we really do know as a population of ferruginous hawks was discovered this summer, in of all places for a prairie hawk, in the Willmore Wilderness. Too late to make the book!

I would like to thank again all the people who participated in this incredible six year project. The birders who spent thousands of hours in the field and completed the data forms, the people who received, reviewed and verified the sightings (a difficult, often controversial, but vital task), the staff (who did far more than they were paid to do) and Glen Semenchuk (whose drive brought the book to completion), all of you have created something of immense value both now and in the future. Well done.

The next task is the establishment of a permanent home for the bird data base, a place where it will be both accessible and safe. We want to make the detailed data collected readily available, whether for researchers, educational purposes, environmental impact assessments or for recreational birders. We are currently looking at several options on how to do this. This data base is the basis of the Atlas but the detail is much finer and accessible in more ways than is possible in the limited format of a book. The data base can also be updated as new data is collected. Potentially the data base could be even more useful and valuable than the published book.

Winter actually is a good time to be outdoors so I wish you all enough snow for your skis and chickadees for your spirits. Enjoy the winter while it is here, spring mud is just a few months away.

Federation of Alberta Naturalists AGM

Hosts: The Red Deer River Naturalists
at the Kerry Wood Nature Centre,
Red Deer
Saturday 30th, January, 1993

Information and Attitudes in Environmental Education

We all appreciate the good work being done by Nature Centres and other environmental resource groups. Many of Us help with field trips or give talks in schools. But what is there for children who don't have interested parents or teachers: What is happening in the regular classrooms? Are environmentally sound facts and attitudes incorporated into all subjects or only taught in special 'units'? How well are the teachers being trained and how much are the students really learning? Speakers will include school supervisors, teachers, students and representatives of organizations that supply curriculum material such as FEESA and SEEDS.

Lunch and supper supplied. Billets available.
Sunday, 31st., January, AGM and Board Meeting.
Field Trips.

Naturalist Hotspots in the Grande Prairie Area

Margot Hervieux

La grande prairie, named by Father Grouard in the early 1880s is a large region of parkland surrounded by montane and boreal forest. This open mix of grassland and aspen woods has resulted from a combination of factors including chinook-like weather systems and the presence of a post-glacial lake. Whatever the cause, the Peace parkland and its adjacent forests support a diverse assemblage of plants and animals. The grassland areas contain white tail and mule deer, elk, black bear and historically even bison. The forested regions to the south and west are home to grizzly bear, cougar, wolf and moose. Closer to the mountains it is even possible to catch a glimpse of the threatened woodland caribou. Over 200 species of birds visit or reside in the area including trumpeter swan, barred and great gray owls, western meadowlark and over twenty species of warbler.

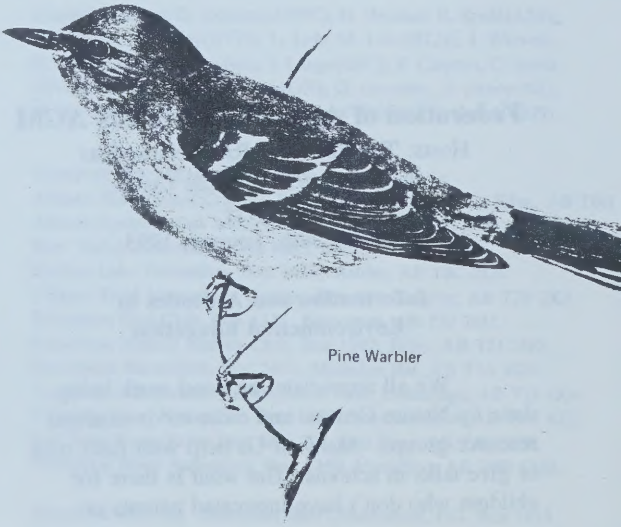
For the modern explorer visiting the Peace parkland, there are a number of hotspots worth checking out. The first stop for most naturalists is Saskatoon Island Provincial Park. Located eighteen kilometres west of Grande Prairie, this is the most accessible site to observe nesting trumpeter swans. The park is situated on the south shore of Saskatoon Lake, one of the largest lakes in the area. It is an excellent place to see waterfowl, particularly during spring and fall migration. The trumpeter swans nest on adjacent Little Lake (historically the two lakes were connected). From the observation deck it is also possible to observe beaver, ducks, grebes, Canada geese and hunting northern harriers. The large area of saskatoon and chokecherry bush between the two lakes is a great spot to search for fox sparrow, cedar waxwing and snowshoe hare.

Overlooking Saskatoon Lake from the west is Saskatoon Mountain. This large hill rises over 150 metres above the surrounding land. It is thought to have remained ice free during the last ice age and archaeological evidence of early man at the site dates to 9,500 years before present.

Saskatoon Mountain Natural Area protects approximately 900 hectares of mixed forest. This is an excellent spot for both birds and wildflowers, especially species usually associated with the mountains. Canada and mourning warblers, solitary and Philadelphia vireos, golden-crowned kinglet and olive-sided flycatcher are among the bird species present. Wildflowers include spotted coralroot, one-sided wintergreen, kneeling angelica and great-spurred violet.

There is a remnant population of Columbian ground squirrel living within the natural area as well as deer, moose and bear. There are few things better after a day on the mountain, however, than the view west towards the Rockies.

In complete contrast to the mixed forests of Saskatoon Mountain are the native grasslands and eroded hills of Kleskun Hill Natural Area. Located nineteen kilometres east of Grande Prairie, the site contains Alberta's northernmost area of badlands. There you can listen to vesper sparrow and western meadowlark and enjoy an endless parade of wildflowers. April is marked by a carpet of crocuses and three-flowered avens followed by arnica and penstemon in June, woodlilies and blooming prickly pear cactus in July and asters and goldenrod in August. This area exhibits both the fine details and the expansive views common in the true prairie of the south.



Pine Warbler

A fourth major habitat common to the region is the pine ridge/wetland complex. Well represented in the Bear River Natural Area just south of Grande Prairie, this mix of sand ridges and fens offers a real contrast between dryland and wetland communities. Birds are less abundant than in some other habitats but yellow-rumped warbler, chickadees, three-toed woodpecker and ruffed grouse are often present. Sandhill crane also nest in the area. The dominant upland plants are lodgepole pine, bearberry and reindeer lichen. The wetlands range from mossy black spruce bogs to open sedge meadows.

These are just a few of the many sites worth visiting in the Grande Prairie area. There are also dinosaur fossils and barred owl at Pipestone Creek, majestic riverine, white spruce and balsam poplar habitats at O'Brien Park and western tanagers and other spring songbirds in south Bear Creek. Wherever and whenever you explore the Peace parkland, you are likely to find a wealth of plants and animals. Even in winter, a bit of serious looking can turn up five or six species of owl and the occasional gyrfalcon. In June, nineteen-hour days offer more than enough time to experience the northern wilderness.

For more information on these and other naturalist hotspots in the Grande Prairie region, contact the author or attend FAN's meeting in July of 1993.

Author's Address:
9358 - 69 Avenue, Grande Prairie, Alberta T8V 6T3.

ROCKY MOUNTAIN HIKING

Wilderness Guiding and Backcountry Courses with a Professional Naturalist

If you have ever wanted to discover the wilderness of the northern rockies but lack the equipment or experience, then consider a guide. Traveling light with only your personal gear lets you concentrate on enjoying the hike. The guide is an experienced professional and qualified naturalist concerned with your personal comfort and enjoyment. Camp and all meals are provided. These trips are well within the ability of beginning to intermediate hikers.

Guided Trips

Mystery Lake A beautifully diverse and interesting trail. An easy hike along Mature boreal forest, and subalpine meadows lead to the Fiddle river. Following the river through a small canyon system leads to the turn off to Mystery Lake. The lake lends itself well to good campfire cooking and backcountry saunas. Dates June 20-21, July 11-12, cost $95.

Cataract Pass An alpine hike through spectacular mountain passes. While more demanding than Mystery Lake, it is certainly not difficult for regular walkers or hikers. This area is surprisingly wild receiving little travel. July 18-19, cost $100.

Introduction to Backcountry Travel

The freedom to travel and explore on your own terms the majesty of the Rockies is a reward in itself. Learn the basics in planning, equipment and safe travel for overnight backcountry trips. This course is taught on an actual overnight trip in the Kootenay Plains area west of Rocky Mountain House. May 30-31, cost $95.

For more information contact:
Doug Latimer , Box 2623, Jasper, Alberta, T0E 1E0, ph. (res) 852-5015.

ALBERTA'S
WATCHABLE
WILDLIFE

Alberta's Watchable Wildlife Program

Harry Stelfox

Wildlife viewing, which includes bird watching, wildlife photography, flower identification and nature study, continues to attract the interest of more and more people from across broad sections of society. Virtually all Albertans express an interest in wildlife and a concern for its welfare, regardless of whether they are big and glamorous species or small and nondescript. Surveys for 1990 showed that 64% of Albertans (approx. 1.15 million people) participated in wildlife viewing in a direct and purposeful way, either near home in their backyards and at local urban parks, or on trips and outings away from home. In 1990, Albertans spent an estimated $350 million on various types of wildlife-viewing equipment and guides and an additional $583 million on expenses related to wildlife-viewing trips.

This growing interest and involvement with wildlife appears to reflect a desire to re-establish contact with the natural world and to achieve a counterbalance to the relentless pressures of daily life in the modern world. Albertans place high importance on opportunities to experience the sights and sounds of wildlife in the outdoors and to learn more about the natural environment. However, it is not always easy for individuals to engage in the types of wildlife-viewing activities they might desire. Most Albertans now live in urban environments where they are separated from the natural world and where they are often caught up in a jam-packed, fast-paced lifestyle. Many people are not sure where and how to participate in wildlife viewing, or how to expand on the limited opportunities they may currently experience.

The Watchable Wildlife Program was established in 1988 to better manage and support these "non-consumptive" recreational uses of wildlife, uses which should not destroy wildlife nor remove them from their natural environment. This program is administered by the Fish and Wildlife Division of Alberta Forestry, Lands and Wildlife and its purpose is to provide the public with more accessible, and better quality, opportunities to view and appreciate wildlife. Additionally, the program is committed to encouraging the development and pursuit of these activities in ways which are sustainable and do not adversely impact wildlife and their habitats. In fact, it is hope that by increasing awareness and understanding of wildlife through such recreational pursuits, that greater public support and active participation will occur in wildlife conservation initiatives. There are potential gains to be achieved for wildlife.

One of the primary thrusts of the Watchable Wildlife Program has been to provide information to the public, in attractive and nontechnical formats. For example, the 96-page **Alberta Wildlife Viewing Guide** and a brochure **on Wildlife Viewing in Alberta** provide information on over 60 wildlife-viewing sites across the province. These publications describe where and when to go and what to look for, as well as tips on how to view and photograph wildlife in an ethically-responsible manner. **A Directory Of References For Alberta's Watchable Wildlife** is currently being revised and updated. This reference booklet identifies numerous publications and information sources which can help individuals of all ages better appreciate Alberta's wildlife, wither in the field or at home. The revised edition will be of particular assistance to individuals who handle wildlife-related information requests from the public. An **Alberta's Watchable Wildlife Calendar** for 1993 has been published and provides monthly wildlife-viewing tips in an informative and attractive manner.

A second principle thrust of the Program has been the ongoing establishment of a provincial network of high quality wildlife-viewing sites which are selected and developed to meet the diverse interests and needs of the wildlife-viewing public. Most sites are easy to access, are located near to the larger population centres, and provide modest support facilities. A smaller number of sites are more difficult to access, occur in more rural and remote locations and have few, if any, support facilities. A number of initiatives have been taken to help with the further identification, evaluation and development of wildlife-viewing sites. Site identification and road access signage has been made available for sites profiled in the viewing guide. Support has been provided for the preparation of site plans, as well as the development of facilities, nature trails and interpretive signs and print materials. A comprehensive manual on how to plan for the development of a wildlife-viewing site is currently being revised and expanded. It will contain many practical examples of viewing facilities and interpretive mechanisms. This manual will be a useful reference for management agencies, local municipalities, community organizations and individuals who are involved in developing and managing viewing sites for the public. Additional support for specific viewing sites is being provided through the preparation of a series of **Watchable Wildlife Checklists** for Birds, Fish, Amphibians, Reptiles, Mammals, and Plants. This project will result in the production of some 140 checklists involving over 60 sites. These checklists provide information on the seasonal occurrence, abundance and breeding status of individual species at a site, as well as the habitat types they are most likely to be seen in. A series of **Wildlife Information Signs for Nature Trails and Viewpoints** provide life-like sketches and informative descriptions of individually-featured wildlife species (including plants). Each sign is produced on a 10″ x 14″ piece of 2 mm-thick plastic material. To date, 65 different signs have been produced in the series and they are available through Maps Alberta at $2.00 each to anyone who is interested. This sign series is being expanded and should eventually contain over 200 different species.

In keeping with the Program's objective of helping people to become more knowledgeable about wildlife and to be actively involved in the conservation of wildlife, other projects have been undertaken. For example, two pamphlets have been produced, one on **How You Can Plan A Christmas Bird Count** and the other on **Working With Wildlife: A Volunteer's Directory**. These two documents describe how you can become involved in projects that directly benefit wildlife.

THIS IS THE PROPERTY OF
THE GOVERNMENT of
ALBERTA
WETLAND
CONSERVATION
PROJECT
IN CO-OPERATION WITH

Birdwatching in Beaverhill Natural Area

Photo by H. Stelfox

The Watchable Wildlife Program has achieved a good measure of success to date because of the tremendous interest and support provided by various project partners, including other government agencies, foundations, local community groups and non-government organizations. By working in partnerships we can do more to secure Alberta's wildlife resource for future generations.

For further information contact:
Coordinator - Alberta's Watchable Wildlife Program at the author's address below, or phone 427-4192.

Acknowledgements
Thanks are extended to D. Culbert for helpful suggestions in preparing this article.

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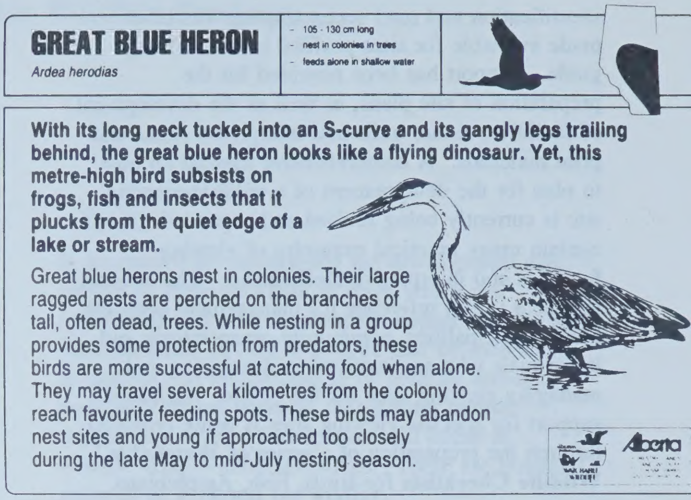
Fish and Wildlife Division, Alberta Forestry, Lands & Wildlife, Main floor 9945 - 108th Street,
Edmonton, Alberta T5K 2G6.



GREAT BLUE HERON
Ardea herodias

- 105 - 130 cm long
- nest in colonies in trees
- feeds alone in shallow water

With its long neck tucked into an S-curve and its gangly legs trailing behind, the great blue heron looks like a flying dinosaur. Yet, this metre-high bird subsists on frogs, fish and insects that it plucks from the quiet edge of a lake or stream.

Great blue herons nest in colonies. Their large ragged nests are perched on the branches of tall, often dead, trees. While nesting in a group provides some protection from predators, these birds are more successful at catching food when alone. They may travel several kilometres from the colony to reach favourite feeding spots. These birds may abandon nest sites and young if approached too closely during the late May to mid-July nesting season.

Wildlife Information Sign - Great blue heron

Clifford E. Lee Nature Sanctuary; Harry Stelfox with a group of young naturalists. Photo by D. Culbert

A Good Day

Philip Boston

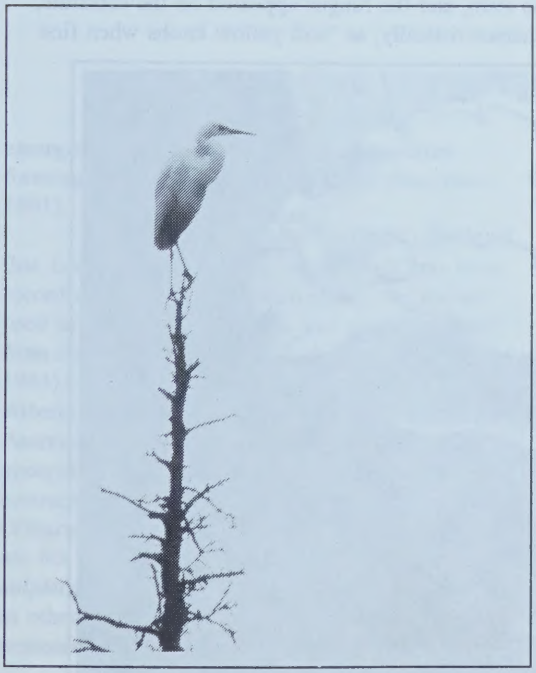
October 30th, 1992 was a good day. I was travelling from the Yukon via Highway 16, towards Edmonton.

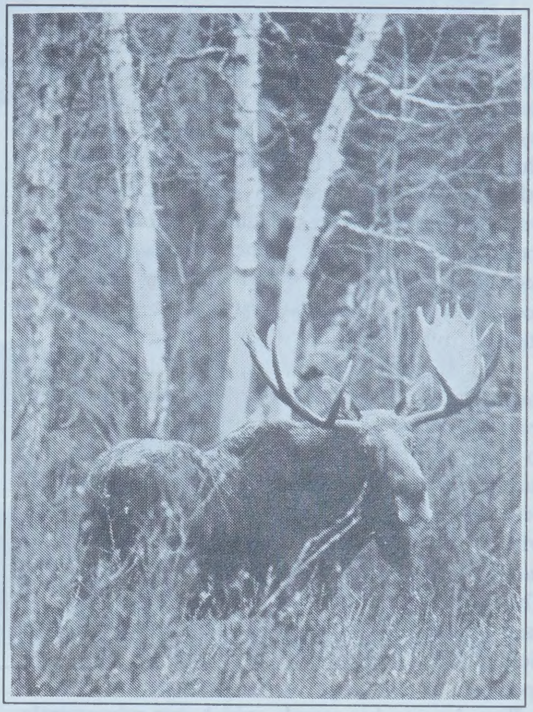
I stopped to photograph one moose in the forest west of McBride, British Columbia. After about one hour we became accustomed to each other. Curiosity and perhaps confidence in my not being a threat brought out a second larger cow moose. She was soon followed by two rather timid, but very curious, calves.

At some time one of the moose came within 20 m and the other three within 50 m of me. After about two hours I continued my journey eastward.

While passing the east end of Moose Lake, near the west boundary of Jasper Park, I glimpsed, in the distance, a fairly light coloured heron at the edge of a pond. The light was getting poor, I was late, so I continued on to Jasper, all the way thinking that it could not have been a heron; it was too light coloured and the neck seemed bent in an uncharacteristic manner.

Accompanied by a Jasper artist, Eva Sisko, who had seen the bird the day previously, I returned to the pond on October 31st.





Moose - Mount Robson Povincial Park.

There it was, a large, perfectly white bird in the company of a flock of Canada geese who appeared not appreciative or impressed by its company. I took some long distance photos and returned a second time later in the day.

When I returned on the morning of November 1st, the large white bird was not to be seen. All was not lost, for I soon was amongst a beautiful bull and cow moose.

The bird? What was it? Very white, yellow beak, long black legs.

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Left: Egret - East end of Moose Lake.
Photos by Philip Boston

Chicken-of-the-Woods

Bill Richards

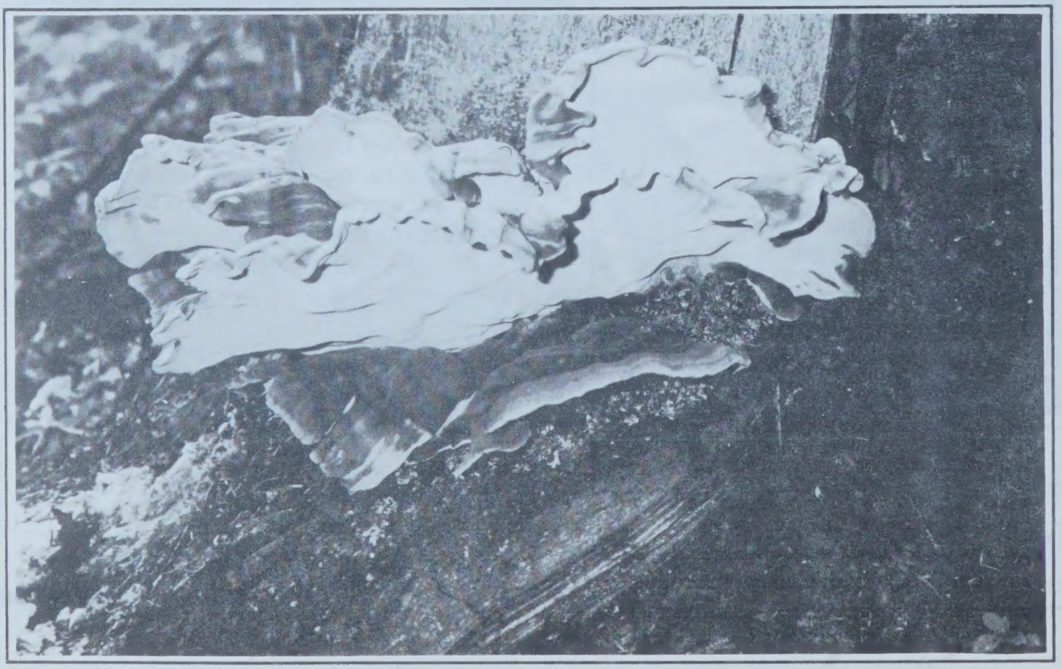
For the past several seasons, the Edmonton Mycological Club has visited Shaw Lake Group campsite, near Lac La Biche, for an extended mycological foray. In 1991, the annual foray to Shaw Lake was held on the long weekend starting Friday August 30. Conditions had been dry for weeks before the outing, which resulted in fungi specimens being in short supply. The participants decided to leave for home early (Sunday morning) because of these conditions, rather than spend another fruitless day.

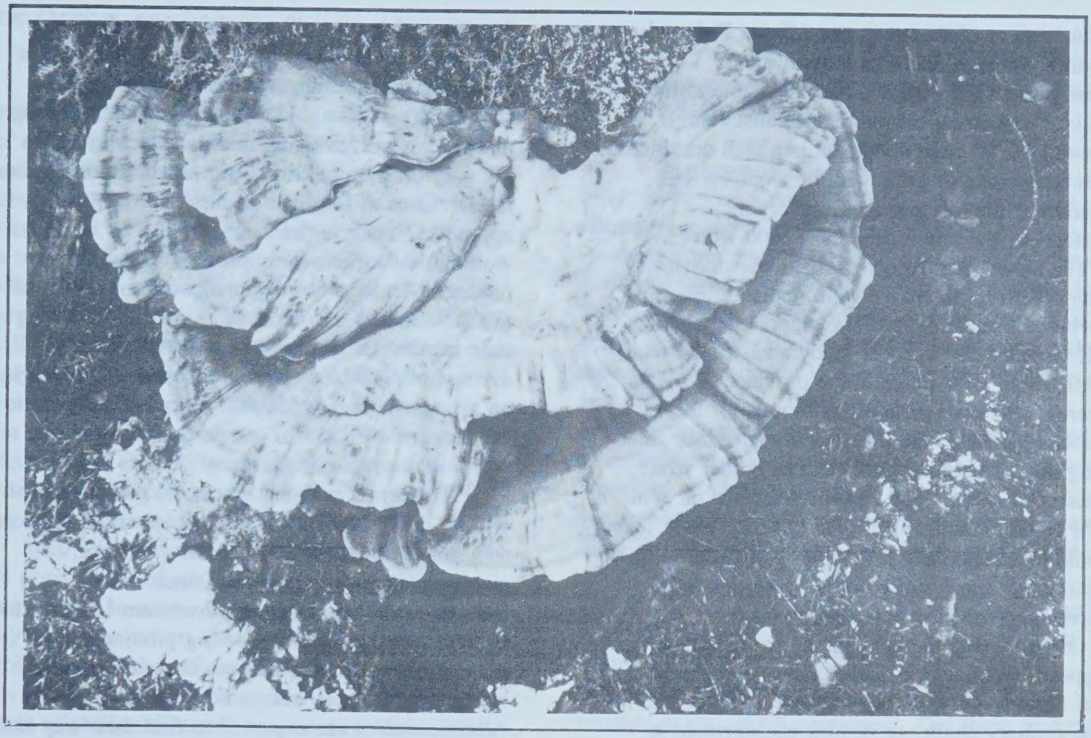
Shortly after departing, about 1 km from the group campsite, I saw a brilliant flash of orange from the corner of my eye. After bringing the car to a stop, we ran back to investigate and, to our surprise, we found a cluster of orange and sulphur-yellow bracket fungi. We immediately guessed that what we were looking at was a *Laetiporus sulphureus* (chicken-of-the-woods or sulphur shelf). The identification was soon confirmed with the assistance of our ever-present library of mycological field guides. Believing we had found the first specimen of this fungus in the province, we collected a voucher sample, which was subsequently deposited in the Provincial Museum of Alberta Herbarium (Accession No. C91.7.9), and a culinary sample, which was quickly relished.

On checking with other herbaria in Alberta, I discovered and confirmed that Bob Danielson of the University of Calgary had taken a personal collection of *L. sulphureus* in 1976 in the Bragg Creek area from what he believed was a white spruce stump (Danielson, personal communication, 1992).

Only one living specimen of *Laetiporus sulphureus* was found near Shaw Lake. It was growing on a balsam fir *(Abies balsamea)* stump in a mature white spruce/balsam fir/balsam poplar forest. However, there were several other stumps and logs in the vicinity, in addition to the specimen site, that showed the chalky remains of previous years' growth. This is visible beneath the specimen in the accompanying photos.

The pleasant-scented fruiting body was semicircular and succulent when fresh, but was chalky, lightweight and brittle when dry. While still attached, this fungus was acting like a siphon, literally drawing moisture from the ground through the stump. The specimen consisted of overlapping, fleshy, smooth-surfaced, orange-yellow caps with sulphur-yellow pores. The flesh was up to 5 cm thick, tapering to 1 cm on the fringes. There was no stem, and the fungus appeared on the substrate, characteristically, as "soft yellow knobs when first





Chicken-of-the-woods or sulphur shelf *Laetiporus sulphureus*. Photos by Vicktor Olsoff

emerging, then they grow into shelves, often forming large clusters..." (Schalkwijk-Barendsen 1991).

Gilbertson and Ryvarden (1986) indicated that *Laetiporus sulphureus* has at some time been recorded for Alberta. Unfortunately, the record used in the 1986 publication was simply repeated from an earlier publication (Lowe and Gilbertson, 1961). Professor Gilbertson suspected that the Alberta record was based on one of the major North American herbaria he and Lowe used for the 1961 synopsis. To his knowledge there are no Alberta accounts in any other literature. Professor Gilbertson also said that he is surprised that there are not more records for Alberta, since *L. sulphureus* is common in Glacier National Park and in other localities in western Montana (Gilbertson, personal communication 1992).

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Schalkwijk-Barendsen, H.M.E. 1991. Mushrooms of Northwestern Canada. Lone Pine Publishing, Edmonton.

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Alberta Releases Wolf Management Plan - Review by Dick Dekker

In January of this year, the Alberta Fish and Wildlife Division made its long-awaited "Management Plan for Wolves" available to the public. Written by carnivore specialist John R. Gunson, the 90-page document is a well-considered attempt to come to grips with the controversial question of how to manage, to everyone's satisfaction, the province's 3500-5000 wolves.

The above population estimate was derived by using data from intensive wolf studies in five provincial localities, and by extrapolating average wolf territory size in these study areas to the total 440,000 km^2 wolf range in the province. Wolves occur in near-natural densities in most of the sparsely settled northern half of the province and along the mountains on its western border with British Columbia. The report recognizes the wolf as "a valued inhabitant of natural ecosystems...that should be maintained at a winter population of 4000 in the long term." How is that to be done? By "harvesting" 20-25% annually.

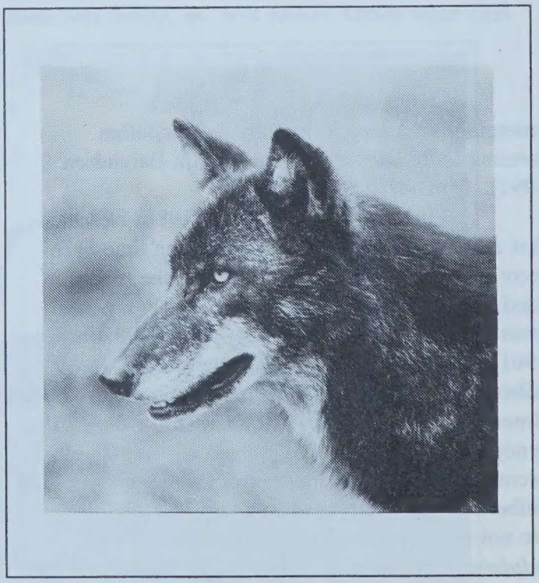
Of late years, the number of wolves killed by trappers and hunters averages about 500 a year. That is far too low, according to the report, and "The primary challenge in wolf management in Alberta is to increase fur trapping and recreational hunting harvests to about 1200 wolves annually."

To encourage provincial trappers to take more wolves, the Fish and Wildlife Division will provide training courses and free snares, and possibly even financial rewards, particularly in areas where wolf predation is scientifically identified as a major limitation to ungulate populations. Where trapper assistance "fails to address ungulate predation problems" the province may institute wolf control through the use of registered and/or contract trappers. However, such a control program would be subject to full scientific assessment and public review, and if adopted, wolf control will be local and temporary.

Recreational hunting of wolves on public lands will be promoted through education and long seasons (from early September to the end of May!). The use of baits and electronic calls to lure wolves may be permitted. Licences will not be required and there is no limit to the number of wolves that can be taken by resident Albertans. There are even fewer restrictions on private lands or grazing leases where wolves may be shot at any time of the year, in the area itself as well as in an eight km buffer zone around the leased area. When ranchers or farmers register a wolf complaint with the provincial government, the Division will assist in removing the offending wolves, mostly by strychnine poisoning. Yet, the report acknowledges that "many wolves living near livestock areas do not prey on livestock." To prevent livestock losses, the Division will initiate discussions with the appropriate agencies and leaseholders to minimize wolf-cattle conflicts by improving husbandry methods. In livestock regions, wolf control by all available means has been a fact of life for a long time in Alberta. From 1972 to 1990 a yearly average of 67 wolves were destroyed. In addition, an average of nearly $50,000 per year was paid to farmers and ranchers in compensation for wolf-killed cattle and sheep.

The report includes a specific provision that will no doubt be of great interest to wolf managers south of the international border: "Alberta wolf management will include assistance to wolf recovery programs in the northwestern USA." How is that to be done? By allowing provincial wolf populations to expand into southwestern foothills where they are very scarce now. From southern Alberta, wolves are expected to find their way into Montana and Idaho.

Reprinted from WolfNews 10(1): 1992.



Timber Wolf Photo: Monte Sloan

Proposed Alberta Wolf Expansion May Backfire

Dick Dekker

The Alberta Wolf Management Plan states that the Fish and Wildlife Division will" assist with wolf recovery south of the international border" by allowing the provincial population to expand southwards. On the surface, that policy seems generous and well-intentioned, but in practice the idea may not be sensible and eventually even become counter-productive. Southwestern Alberta is largely the domain of ranchers who have the right to kill any wolf any time on their lands. In the mainly open habitats of southwestern Alberta, wolves wouldn't stand a chance unless they are given special protected status. Such a deal may be difficult to sell to the livestock industry, and the enforcement of protected measures might easily result in negative publicity for the wolf.

At present, southwestern Alberta contains large populations of elk and deer, making the region a paradise for hunters. They, too, would have much to say about the return of wolves. Faced with the combined opposition of ranchers and hunters, the effort aimed at re-establishing wolves in southern Alberta might backfire and become an exercise in frustration for all parties concerned. It might reopen the long wolf debate that just recently, for the first time in decades, seems to have subsided into an unprecedented level of tolerance on all sides. In my discussions with hunters, I have often made the point that the great hunting opportunities in south-western Alberta should lessen demand elsewhere, such as in west-central Alberta where hunters have to share the range with wolves. I for one would not support the enforced return of wolves into the southwest of the province unless they are wanted by the people who live there.

Notwithstanding the above, the message conveyed by the Alberta Wolf Management Plan is positive. Even though it insists that some caribou, elk and moose populations are at dangerously low levels, the province does not intend to use the more severe forms of wolf control, such as aerial shooting and poisoning, on wilderness lands. These methods were judged to be "socially unacceptable." It remains to be seen how long it will be before trapping and poisoning in livestock areas will be equally unacceptable to the Alberta public.

Wolves Escape from Government-Issued Snares Set by Alberta Trappers

A trapper training program has been in effect in Alberta since 1983, involving about 300 trappers annually. As reported in the newly-released provincial Wolf Management Plan, participants received 4780 complimentary snares in 1983. No figures are supplied for other years. In some areas, trappers' take remained low despite the training programs, but in the Rocky Mountain House district, three times more wolves than average were taken. These trappers were provided with the carcasses of road-killed ungulates that were dumped in designated spots in the woods year-round. Wolves could come and go for an easy meal until the fateful day when the trapper closed off all entry to the baits with snares. The snare tightens the more the captured animal struggles and a locking device prevents the noose from opening again. In 1986-87, a total of 33 wolves were caught. In addition, as stated in the Plan, 25 escaped again. What happened? Did these wolves, during their struggle, snap the wire and get away with the snare taut around their neck or body? The editor put this question to the author of the Plan, who answered that the locks had broken. The captured animals pulled out again and the snare probably fell off harmlessly...

Still no Buffer Zone Around Alberta's National Parks

It is unfortunate that the Alberta Wolf Management Plan fails to address an idea that wolf protectionists have been promoting for a long time: the establishment of a no-hunting/trapping zone around Jasper and Banff National Parks. Currently, these parks are the only areas in Alberta where wolves and other wildlife are fully protected, but the parks are not quite large enough to contain wide-ranging carnivores like wolves.

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Status of Woodland Caribou in the Caribou Mountains of Alberta

Bob Gainer

Compared to other provinces, Alberta has relatively few caribou. The woodland subspecies is sparsely distributed along its western edge as far south as Jasper National Park, north to the Northwest Territories, and then east along the north of the province including the Cameron Hills, Caribou Mountains, Birch Hills and Buffalohead Hills. The barrenland subspecies briefly occupies to a variable extent the northeast corner of the province during the latter part of the winter. All of these areas are remote from human contact except for occasional trappers, fly-in fishermen and petrochemical workers. Of particular interest to me is the existence of the woodland race in the Caribou Mountains.

While living in the area during the 1980s, my work and recreation meant that I visited and flew over these mountains several times. The Caribou Mountains (or hills) are quite a diverse, and for Alberta, unique habitat type. In the early 1980s when the province was soliciting ideas for ecological preserves, this area was proposed (but not implemented).

The plateau (Margaret Lake is 838 m asl, the surrounding area is less than 1015 asl) is scattered with ponds and lakes of varying size (up to 500 sq km for Margaret Lake) over generally boggy terrain. Vegetation is typically moss and lichen ground cover with scattered black spruce and labrador tea woodland. Land oriented to the north especially has a dense lichen cover and permafrost; that oriented to the south has a denser tree cover.

The sides of the Caribou Mountains have a high white spruce and aspen component. The south and west slopes have a significant patchwork of clear cut logging. The north and east slopes are wilderness in the extreme. All over the plateau are petrochemical survey, seismic and exploration cut lines and clearings used during the period of "winter pavement". Along the base of the south slope is farming associated with the Peace River Valley, along the west base is the MacKenzie Highway, the north base is bordered by Great Slave Lake (along which the Fort Smith-Hay River Highway skirts) and the east base is an enormous, virtually untouched area of Wood Buffalo National Park.

A general pattern for caribou occupation of this area is in the summer to inhabit the open, scattered black spruce, moss and ground lichen covered permafrost areas on the plateau and in the winter to move into the more heavily treed areas. During the winter, they often are observed near Pine Point, NWT, some have been observed in eastern Wood Buffalo National Park, some have been observed along the western slopes in the Steen River area and some have been observed on the plateau by people in or flying over the area. Virtually none are observed on the more populated, farmed base of the southern slopes. The aversion caribou have for this settled area may explain some of the animals overwintering on the plateau.

In 1990, Alberta's Energy Resources Conservation Board sponsored a meeting to address the threatened status of woodland caribou in the province, especially in the "Greater Jasper Ecosystem". Some concerns that came out of the meeting were the lack of information and data on these animals in Alberta, non-human and human predation, the spread of white-tailed deer into the caribou's range and the meningeal worm mortality in caribou associated with it, and the general loss of habitat associated with human activity in their home range. Subsequent to this meeting I visited the area in and around the Caribou Mountains in September 1991 to assess the status of the caribou in this area to see how they compared with those of the Greater Jasper Ecosystem.

At the end of 1980, the province closed the hunting season on caribou. This did not apply to the regular native harvest or the winter harvest in the Pine Point area by Territorial residents. At that time, for anyone who made the effort to visit the plateau in the wintertime, caribou were easy to get.

Talking with Chuck Whipple at Margaret Lake Fishing Lodge in September, caribou are still very easy for the natives to acquire. His impression from the frequency of his and his guests' sightings of the animals while fishing, the number of animals attracted to the lodge on a regular basis, their tracks along the shore, and the ease by which the natives were getting them, is that they are much more common than before. In addition, talking to Bob and Mary-Lou Garlic, former residents of Pine Point area found increasing numbers of caribou near the open pit mine and increasing numbers (although low) were being harvested. Since the closure of the Pine Point mine in 1987, Bill Betzhold of Hay River, second vice president of the NWT Wildlife Federation, has hunted the area and said they seemed to be increasing in number and easier to get. If the native and Territorial hunting effort is the same or less than before to satisfy the same demand, it would support local impressions that the population number has increased. It would also suggest that the human harvest (including the even less significant non-native harvest of mature trophy males) would not have been a factor in reducing their population size.

During the 1980s bears and wolves were common in this part of the country. Flying low and slow over the plateau in the winter I and other local pilots would often see several small groups of two to five caribou standing in the middle of a pond looking at about the same number of wolves around the edges. During the summer fishermen would often see wolves or their tracks along the lakeshores. In addition wolves were a serious livestock concern in the Fort Vermilion area (primarily of young calves), some even being snared in the town trying to get into chicken coops and back porches.

Similarly bears were formerly quite a problem for several of the fishing camps in the Caribou Mountains. They would break into the buildings, destroy gear and generally be a serious nuisance. The base camp had dogs to let people know when they were around. As well bears seemed extremely plentiful in the crops along the southern base of the mountains and for a while were a serious cause of mortality of cattle on the Provincial Grazing Reserve on the lower southern slope. Several times bears had to be shot or trapped right in Fort Vermilion.

Now however, several lines of evidence suggest that there are far fewer wolves and bears in the area. For several years, Margaret Lake Fishing Lodge has not had any problem with bears. They are rarely seen and the buildings are not broken into anymore. Wolves as well seem to have almost disappeared from the area. In the settled areas to the south and west problems with both species are much reduced. Lu Carbyn of the Canadian Wildlife Service has publicly described a dramatic decrease in wolf numbers in nearby Wood Buffalo National Park. The park also seems to have noticeably fewer bears than five years ago. This decrease in these predators has not been the result of a deliberate control program but instead seems to be a natural cycle (although not well synchronized with the snowshoe hares'). Coyotes strangely enough seem to be more abundant around the base of the mountains.

White-tailed deer have expanded their range dramatically during this last century coming from essentially an eastern North American species to what is now a common species in the north and west. Otto Hohn reported their presence in Uranium City in the mid 1950s and they are plentiful now in High Level and forts Vermilion and Smith. Bob and Mary-Lou Garlic say that about 1985 workers coming back from the open-pit mine west of Pine Point increasingly mentioned encountering white-tails. At the same time and place, the residents in the area were noticing increasing numbers of wintering caribou. These white-tails probably moved west from the Fort Smith area as is there general movement trend. Bill Betzhold says truckers often mention encountering them on the Fort Simpson Highway now and on the MacKenzie Highway south of the NWT Alberta border. For some reason they are seldom noticed near Hay River.

In eastern areas of North America caribou and white-tails do not coexist. Biologists associate this with a meningeal worm, natural and essentially benign to white-tails, that causes severe injury and death to caribou. Both caribou and white-tails have increased their number in the area of the Caribou Mountains simultaneously. Where it is especially noticeable it seems, is in the area near the old open pit mine near Pine Point. At the moment the meningeal worm infection of white-tails does not occur west of Manitoba. Until it does, it appears as though the two species may continue to coexist in this region.

Logging and petrochemical activities have been going on in this region since the 1950s. Logging takes place primarily on the south and west slopes and petrochemical activity on the plateau. In addition, large areas of the plateau have had forest fires. When viewed from above, it can seem unsightly but the regeneration associated with the removal of old growth adds to the caribou summer food supply. Caribou winter food has a significant tree lichen component that would be damaged by these events. It may not be limiting in the short term but it takes an extremely long time to replace. The cut lines and clearings would improve caribou escape terrain. During the last decade, the rate at which trees have been cleared has not been altered significantly.

From the foregoing discussion of impressions by local hunter-naturalists, it is difficult to see how any of these factors discussed at the Conservation Board meeting, other than the apparent natural reduction of predators, may have accounted for an increase in the caribou numbers. The human harvest seems about the same, forestry, petrochemical exploration and logging activity has stayed about the same and, if anything, white-tails have had a dramatic non-impact. A possibility not discussed by the

Conservation Board is immigration from nearby populations, in this case from the Birch Hills, Buffalohead Hills, or Cameron Hills.

How the Caribou Mountains population relates to the Greater Jasper Ecosystem can only be speculated at. Whatever, it is still gratifying to know these bizarre creatures, prehistoric relics of the ice ages, exist in an apparent secure state in a part of the world too inhospitable for any but the most incredible of survivors.

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A Ferruginous Hawk *(Buteo regalis)* in the Rockies

Karl Grantmyre

In the past there have been few reports of ferruginous hawks *(Buteo regalis)* in the mountains of Alberta. According to the Canadian Wildlife Service, there have only been two positive sightings of this species in the mountains: one in 1944 near Brazeau Lake, and the other in 1974 near the North Saskatchewan River Crossing. There have been no recorded sightings any further north.

In early August of 1992, Dr. Glenda Hanna and her husband Michael were hiking with a group of twelve people in the Willmore Wilderness area of western Alberta. The area in question is one of the most remote in all of Alberta. While on a dayhike from base camp near Casket Pass (119.56W/53.47N - 1723 m) they found a hawk that had injured its wing. Although it was four days walk to the town of Grand Cache, they decided to take it with them, rather than leave it to suffer. The bird was brought to the Fish and Wildlife Division, in good health and then to the Strathcona Raptor Shelter and the Alberta Society for Injured Birds of Prey in Sherwood Park, where it was identified as a ferruginous hawk; an immature female.

Ferruginous hawks *(Buteo regalis)* are a hawk of the open plains. One of the larger hawks (the word "regalis" is for its size), it is primarily a rodent eater. Their range is described in William Clark and Brian Wheeler as "west great plains west to central Washington, Oregon and N.W. Nevada, north into southern Canada, and south into northern Arizona and N.W. Texas". Brown and Amadon in "Birds of Prey of the World" mention a normal, dark and rufous phase. Their habitat is described as "breeding on undisturbed plains, sagegrass, high deserts, badlands, or edges of pinyon-juniper" . In Alberta, the Society has banded them in cliff nests along southern Alberta rivers. They are shy and retiring but fairly common across their range. In Canada they are currently listed as an endangered (threatened) species. The ferruginous hawk soars with its wings in a stronger dihedral than a red-tailed hawk *(Buteo jamaicensis)*, and it is a deft flyer. It will fly swiftly, low over open ground, a characteristic not common in buteos. They have also been shown to hover and swoop down from a perch to catch their prey. Ground squirrels and jackrabbits, and occasionally other small mammals and birds are their commonly recorded prey.

The uniqueness of this raptor/habitat combination lends itself to speculation. Indeed the protection and further study of this and other more remote areas of Alberta may yield valuable opportunities for future generations, not only of people but wildlife as well.

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Small Protected Areas Stewardship Course

Faculty of Extension, University of Alberta, March 20, 1992

Don Stiles and Derek Johnson

This course involved one hour lectures by Dr. Jim Butler and Lesley Brown in the morning, followed by workshops in the afternoon. Books and handouts were available for perusal during breaks. There were 20 participants, including recreational consultants, nature centre employees, non-governmental organization members, and students.

History and Value of Small Protected Areas

by Dr. Jim Butler - Professor of Parks and Wildlife Conservation - University of Alberta

"Small" protected areas were defined by Dr. Butler as those areas which encompass less than 1000 hectares. The history of some individuals who have been involved in the conservation of these areas was discussed in this lecture. Some of those mentioned were John Muir, the first person to use the word "interpret"; Galen Clarke, the first park ranger (at Yosemite); Jack Miner, who worked with geese in Ontario; and Henry David Thoreau.

Dr. Butler had a slide presentation of several small protected areas around the world, and explained some of the specific attributes of these particular areas. They may be named "Conservation Area", "Preservation Area", "Sanctuary", "Pocket Wilderness", "National Monument", or "registered Natural History Landmark". They may have a ranger, a steward, or a custodian. Some names more commonly used for these areas in Canada are: Watchable Wildlife Area, Catch and Release Area, Natural Area, Wildlife Preserve, or World Heritage Site.

A few active management techniques for these areas were discussed at this lecture. The professor spoke about the use of fire in land management, and about the elimination of predators on an island in New Zealand in an effort to preserve a primitive lizard species. The most drastic management technique Dr. Butler mentioned come from a wildlife preserve in Singapore. This preserve has a sign posted, which reads "Keep Out or Get Shot - No Warning".

Holistic Management of Small Protected Areas

Lesley Brown - Ph.D. Student -University of Alberta

Ms. Brown outlined the holistic approach to the management of small protected areas. This involves looking at the "big picture" - the economic, social, and biological health of an area. The air, soil, water, fauna, vegetation, cultural, and visitor's support systems inside an area must all be taken into account when discussing conservation or management strategies for small protected areas. As well, the water, fauna, and human activities outside an area should be addressed.

The smaller a reserve is, the more dependent it is on outside forces. Ms. Brown spent time during her lecture talking about fragmentation, and its effects on small areas. Wind, light, and moisture are changed with fragmentation, thus affecting several other aspects of an area. For example - a road cutting through an area will give acute loss of habitat up to 200 m from the edge of the road, and moderate habitat loss up to 400 m from the edge. Artificial edges do offer habitat for some species, but these are generally the more common species such as the american robin, the black-billed magpie, and the tree swallow. Interior species such as the hairy woodpecker and the pileated woodpecker generally experience loss in fragmentation circumstances.

Ms. Brown listed several of the effects of fragmentation on an area. Some of these are:

1. Habitat Loss
2. Habitat Alteration
3. Species Composition Change
4. Barrier to Movement Outside the Area
5. Inbreeding
6. Disturbance Increase

Management implications for small protected areas indicate the need for buffer zones - zones around the areas which would "cushion" and protect the area from encroachment.

There is a perception that protected areas cannot generate revenue, and are economically unsound. Ms. Brown believes this not to be the case, and pointed out in her lecture that these areas can be used for passive recreation such as birdwatching. She also believes that education is needed to counteract the myth that ecological reserves are distant places only available to the scientist.

Some of the threats to protected areas are: inadequate management as a result of budget constraints; human encroachment and abuse; industrial and agricultural activity; and exotic species that are introduced and choke out the naturally occurring species of the area.

A holistic approach to the management of these areas would include: a Landscape Perspective (an understanding of the landscape of the area); a Systems Plan; an Information Base which would outline the biology and wildlife of the area; measurable objectives that could be implemented to effect conservation of the area; and a management plan for the area.

Some attributes of a holistic management approach are:

. a pro-active research program
. a public relations and communication program
. mechanisms to involve the community, especially initially
. mechanisms to contribute to the economy (ecotourism)
. a visitor program
. an environmental education program
. a landowner contact program for buffer zones
. an active management program
. ongoing staff training
. network and innovation

During afternoon workshops, the group was asked to choose from a number of topics for discussion. This allowed input from the participants as well as the lectures.

Topics For Discussion

1. **Networking** - recent natural areas conferences in Calgary and Sherwood Park were given as examples. The University of Alberta operates a Protected Areas Management Program directed by Bert Einseidel. This course was one of seven put on by them. It was suggested that small areas could be added to an annual municipal conference on recreation.

2. **Public Relations, Communications** - (a) to convince politicians of the value of "No Maintenance Areas" -areas that are set aside for recreational activities such as birdwatching and nature hike, but which require very little upkeep. They have very few facilities such as washrooms or picnic areas and, therefore, long term costs for these areas are low.

(b) to advise the public what is being done through the media, nature centres, signs, etc.

(c) to advertise what is unique about the park. Property values are higher around protected areas.

3. **Active Management** - recommended, because passive reclamation is too slow. The group discussed the benefits of using controlled burns and of weed pulling.

4. **Choosing and Prioritizing** - local populations should have an input into the priorities of any project, particularly in urban areas.

5. **What Is Basic To An Information Base?** - the group examined the most important aspects of an information base as being diversity, naturalness, connectiveness, and the degree of threat in an area.

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BIRDQUEST

Learn about North American birds – their identification, life histories, habitat and conservation needs – through the *Canadian Nature Federation's* and the *Canadian Wildlife Service's* (Environment Canada) new education program, BIRDQUEST. Each instructor's kit includes a VHS instructional video,work-book, badges and certificates. Suitable for groups, schools, clubs, etc. All age levels. $49.95 plus shipping and taxes.

To order or for more information, call the CNF at 1-800-267 4088.

Also available in French as A TIRE-D'AILE.

Phone FAN at 453-8629 for assisted purchase.

Birding Help

Compiled by Jim Robertson from various sources. Thanks to Myrna Pearman of the Ellis Bird Farm Ltd. and Tom Hauck of Point Pelee National Park for their help with this.

Natural history interpreters are often expected to be good field naturalists, knowledgeable in many field. But when it comes right down to it, if they are ever judged on any single part of their knowledge, it is usually on birds. Once an interpretive naturalist advances past the *what is it?* stage and actually want to interpret the feathered wonder to the world, where can he or she turn for information?

There are several birding magazines on the market to which interpreters or their agency libraries might wish to subscribe.

Canadian Magazine

In addition to general-interest nature magazines such as *Nature Canada* (Canadian Nature Federation), or general journals such as the *Canadian Field Naturalist* (Ottawa Field Naturalist Club) or the provincial and local naturalist-club newsletters, journals, and other publications, such as *Blue Jay* (saskatchewan), *The Alberta Naturalist* (Federation of Alberta Naturalists), *Pica* (Calgary Field Naturalists), etc. There are several birds-only publications on the market.

Canadian Birding is a black and white, newsletter-style quarterly. Best for the lister; has some general info. Subscriptions: $17/one year; $32/two years, including GST. Contact: Subscriptions, Site 14A, Box 43, RR#4, Armdale, NS, B3L 4J4.

Birds of the Wild is the new kid on the block. Glossy, colour, quarterly. More general information. Subscriptions: $16/one year, $28/two years. Contact: 250 Cochrane Drive, Unit 4, Markham, Ont. L3R 8E5.

American Magazines

American Birds, by the National Audubon Society. Academic articles; for the serious lister, includes bird count species lists, and sightings, plus site guides. Four regular issues plus a Christmas Bird Count issue each year. Canadian subscribers have to pay US$37/year. Contact: 950 Third Avenue, New York, NY, USA, 10126-0066.

Bird Watcher's Digest is a bimonthly magazine the size of *Reader's Digest*. Has good interpretive stuff by Stokes (authors of the guidebooks to behaviour watching). Has interpretive info on 1 species/issue, as well as chatty "My Backyard Bird Feeder by Joe Blow" -type articles, too. Good general info & articles on nest box building, etc. Canadian subscribers pay US$20.95/year. Contact: P.O. Box 110, Marietta, Ohio, USA, 45750.

Birder's World, a glossy bimonthly, cost US$28/year. Good general info, a variety of articles, excellent photos. Contact: Subscription Dept., P.O. Box 1347, Elmhurst, Il, USA, 60126-9718.

Birding is the bimonthly magazine for members of the American Birding Association. For the lister. Also in-depth identification guides, site guides. Also in the US$30 annual membership ($37/family) is the monthly newsletter, *Winging It*. Contact: P.O. Box 6599, Colorado Springs, CO, USA, 80934.

Living Bird is the quarterly magazine of Cornell University's Laboratory of Ornithology, Research oriented, but contains good info. Comes with a quarterly newsletter, *Birdscope*. For the sophisticated amateur. Slightly watered-down and more readable technical articles. Comes with discounts at their store, a home-study course in bird biology, and the opportunity to participate in programs such as Project FeederWatch. US$40/year. Contact: 159 Sapsucker Woods Road, Ithica, NY, USA, 14850.

WildBird is a monthly glossy. Lots of good general info. Subscriptions: $31.97/year, $48/2 years, plus GST. Pay by international money order. Contact: Subscription Dept., P.O. Box 52898, Boulder, CO, USA, 80323-2898.

Auk and *Condor* are technical journals, I'm told. I've not seen either.

Purple Martin Update is a quarterly, put out by the Purple Martin Conservation Association. It is a glossy, colour magazine, with a bit of everything in it from "My Backyard Birds by Joe Blow" to scientific papers. $16 U.S. individual,

$20 family. Edinboro University of Pennsylvania, Edinboro, PA 16444 U.S.A.

Nature Society News is another purple martin publication. Monthly, newspaper format, more chatty and more of "My Backyard Birds" than the previous magazine. Has an occasional blurb on this group's collection of steam locomotives, too. (Really!) Write Purple Martin Junction, Griggsville, Il. 62340 U.S.A. $17 U.S. regular, $32 sustaining, $12 student members for Canada.

Books

The *Stokes* series of books is a most useful source of information for bird interpreters. *A Guide to Bird Behaviour, Vol. 1, 2, and 3,* and *A Guide to Nature In Winter* by Donald and (in some cases) Lillian Stokes, published by Little, Brown come highly recommended.

The Birder's Handbook, by Ehrlich, Dobkin, and Wheye might be the single best resource available for a bird interpreter. Almost 5 cm thick, it has comprehensive information about every North American bird, as well as great essays full of interpretable information.

The *Bent* series of life histories -- written many, many years ago -- is still the single most comprehensive source of information. You'd have to be pretty rich to buy them for yourself, though. Get the agency library to order them.

On the subject of bluebirds: The Ellis Bird Farm Ltd,. Box 2980, Lacombe, AB T0C 1S0 maintains a directory ($3.00 Canadian) of people and organizations interested in bluebirds.

The Bird Farm also awards annual research and educational project contracts to people interested in bluebirds and other cavity nesting birds. The deadline for applications is the end of August; write to their Education or Research Committees for information.

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From the Birding Corner

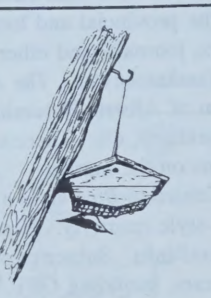
Tom Pierce

We are now into the time when our bird feeders should be in place and full of goodies. These goodies should contain some of the following:

Sunflower seeds -- small black (oil) or large striped
- Chickadees
- Evening Grosbeaks
- Purple Finches
- Red-breasted Nuthatches
- Pine Siskins
- Redpolls
- Bluejays
- White-breasted Nuthatches

Mixed Seed - Millet (up to 3 types), Sunflower, Wild Canary seed
- Juncos
- Transient Native Sparrows
- Pine Siskins
- Redpolls

Canola (Rapeseed)
- Pine Siskins
- Purple Finches
- Redpolls



Niger Seed (Sterile African Thistle Seed)
- Pine Siskins
- Redpolls

Suet (Beef Fat), Commercial Suet Balls
- Chickadees
- Both Red- and White-breasted Nuthatches
- Downy Woodpecker
- Hairy Woodpecker

Feeding birds in the winter is done by most people for two main reasons:
1. enjoyment of watching the birds
2. providing food to help the birds through the winter.

Reprinted from Kerry Wood Native Centre Association Newsletter 10/27/92.

Announcements

"Birds In The Boreal Forest" Workshop

Prince Albert, Saskatchewan

10 - 12 March 1992

A workshop was held in Prince Albert, Saskatchewan on ecology in western and northern Canada. The workshop brought foresters and biologists together to develop plans for research that will contribute to improved management of forests for biological diversity.

The main focus was on migratory songbirds as a component of biological diversity whose vulnerability to habitat management in western boreal forests is much less well known than wildlife for which forests are more commonly managed, such as game species and furbearers. Birds make up 78% of the vertebrate species in the mixedwood forest of western and northern Canada, and many are vulnerable to habitat degradation on tropical wintering grounds as well as to changes to their breeding habitat.

The principal objective of the meeting was to determine the best ways to assess the impacts of forest management practices on songbirds, especially in the mixedwood forest region of the prairie provinces and Northwest Territories. A second objective was to foster interactions between those concerned with sustaining forests as an industrial resource, and those interested in the sustainability of the forest as a habitat for songbirds and other wildlife.

There were two keynote papers to set the scene, including one by Prof. Malcolm Hunter of the University of Maine, author of Wildlife, Forests, and Forestry: Principles of Managing Forests for Biological Diversity. These were followed by invited papers on each of the major session topics:

- overviews of the distribution and abundance of songbirds in the boreal forest;
- the state of knowledge of the impacts of forest management on forest birds; what do we know, and what do we need to know?
- understanding forest landscape - how do we 'scale up' our understanding from the level of the forest stand to the forest ecosystem?
- what management practices most urgently need to be assessed for their impacts?
- what databases and information networks already exist to support this work, and what new ones need to be set up?

Substantial time was allocated to discussion in each session. Papers and discussions were recorded.

This workshop was sponsored by the Canadian Wildlife Service (Environment Canada), Forestry Canada, Saskatchewan Parks and Canada, Canadian Parks Service)

Proceedings of this workshop are available, at no charge, from Dieter Kuhnke, Northern Forestry Centre, 5320 - 122 Street, Edmonton, Alberta T6H 3S5 (435-7271).

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The Alberta Native Plant Council

presents

GREEN SPACES, MOUNTAIN PLACE

A One-day Conference on
Mountain Flora Under Pressure

February 20, 1993

The University of Calgary
Calgary, Alberta

Conference Topics Include:

- Bow Valley Corridor Development Concerns;
- Yamnuska Natural Area;
- National and Provincial Parks Policy;
- Canmore Municipal Planning Commission;
- Mitigation and Monitoring of Vegetation in Mountain Regions.

U. of C. Campus, Earth Sciences Rm. 162
Registration 8:30 - 9:00 a.m.
Conference 9:00 a.m. - 4:30 p.m.
Annual General Meeting to follow

(Bring your own mug! Lunch can be purchased on campus, or bring a bag lunch)

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Book Review

The Fishes of Alberta
(Completely revised, second edition). Joseph S. Nelson and Martin J. Paetz
University of Alberta Press
University of Calgary Press

Joe Nelson and Martin Paetz note in the preface of their recently published Fishes of Alberta "A great deal has been learned about Alberta fishes since the first edition of The Fishes of Alberta appeared in 1970". The authors have thoughtfully packaged much new knowledge of our fish fauna in an easily readable and informative fashion in their completely revised book. This book will be useful for a broad range of users from children to biologists.

A brief introduction discusses the extent and variety of fish habitat present in Alberta and points out that only a small but diverse assemblage of fishes occurs here. Readers are encouraged to learn more about fish and to appreciate them no matter how they experience them.

Commercial, domestic and recreational fisheries are discussed in chapter one. A brief history of commercial fishing precedes a drainage by drainage discussion of Alberta's fisheries primarily from a sportfishing perspective. Fish management, including sections on the history of fish culture in Alberta and fish farming is the subject of chapter two.

Chapter three on fish ecology provides a thorough introduction to both the habitats occupied by fishes and general biology of fishes. This chapter provides a wealth of information on streams and lakes as well as a discussion of seasonal changes and how they affect the lives of fishes.

An overview of how Alberta was repopulated by fish following Pleistocene glaciation is provided in chapter four. A brief history of glaciation on Alberta is followed by a discussion of refugia available to fish and probable routes of reinvasion.

The important topic of the species concept and classification are well presented in chapter five. Isolating mechanisms, hybridization, how and why species are named, as well as classification into families and more inclusive groups are discussed. A classification and checklist of fishes of Alberta is presented. Chapter six is brief but contains much information regarding the evolution of Alberta's fishes and fish fossils.

Chapter seven guides the reader through use of distribution maps, identification keys and provides the reader with information about the anatomy of fish as well as how to make counts and measurements used for identification of fish. The excellent illustrations (line drawings by Annemarie Mobach) in chapter seven are particularly instructive.

A key to the families of fishes found in Alberta (chapter eight) includes a pictorial key. Chapters nine through twenty-three deal with the fish families found in Alberta. A key to the species of fish in each family is provided. For most species there is a distribution map and a photograph.

The distribution maps have both presumed range (shaded) and locality records for a species. In some cases (bull trout for example) the presumed range is somewhat conservative as its former range was much more extensive. The photographs vary considerably in quality and more of the limited number of colour plates allotted might have been devoted to fish rather than habitat shots or pictures of fish culture facilities. The book is overall well illustrated.

Additional information regarding additional species (not established in Alberta) of fish, features of certain lakes and discharge of major rivers, is provided in appendices. An extensive glossary follows. The book contains 24 pages of references.

The Fishes of Alberta is well written and informative and a bargain at $34.95 cloth ($24.95 paper).

Wayne Roberts

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Nestboxes for Prairie Birds

This 80 page book is a comprehensive guide to cavity-nesting bird conservation on the Canadian prairies. It contains 54 beautiful colour photographs and 80 illustrations. A summary of the book contents are listed on the back of the enclosed cover.

The book retails for $18.50 plus shipping and GST.

Contact your local Nature History Club or phone 346-2211 in Lacombe.

Join the World of *CANADIAN BIRDING!*

In November 1989, after nine successful years of publication, *Birdfinding in Canada* (B.I.C.) sent out its last issue. Gerry Bennett's one-man effort in producing all 54 of the newsletter's issues was monumental: he managed to create something different from any other bird-related publication on the market, filling a pleasant niche between hard-core birding journals and chatty nature magazines. B.I.C. tied together the loose fraternity of birders throughout this immense land, and did so in a pleasing, informative, and timely style. We can't let his work end here. Therefore, we are proud to announce the arrival of ***Canadian Birding***, the newsletter that begins where B.I.C. left off. This new publication will be a cooperative effort involving some of Canada's most avid birders. We are hoping that this diversity of support will contribute to the long-term strength of the newsletter.

We intend to start cautiously and conservatively, working within our budget and resources, continuing with the best of the old and carefully adding the new. ***Canadian Birding*** will start as a quarterly, with issues mailed out in April/May, July/August, October/November, and January/February. Many of B.I.C.'s most popular departments will be retained to preserve continuity, and new features will be added. Some of the regular items you can look forward to in ***Canadian Birding*** include:

- Site descriptions of birding locations across Canada.
- Accounts of trips to familiar or little known corners of the country.
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1991 May Species Count for Birds and Mammals

Ross Dickson

If the 1991 provincial bird species count proved anything, it was that in order to find large numbers of birds, count organizers should recruit large numbers of birdwatchers. This was the sixteenth provincial count conducted by the Federation of Alberta Naturalists and it was successful because so many people were involved. In sixteen count areas, 272 observers reported 83594 birds of 258 bird species. Each of those preceding numbers represents a new record. The previous maximums - all set in 1990 - were 14 counts, 218 birdwatchers, 75929 birds and 240 species.

This orgy of record-smashing was aided by several factors. Weather conditions for the main weekend (May 25-26) and the following weekend (June 1-2) were generally sunny, dry and with light winds, so there was a big turnout. In Edmonton, 71 people took part, continuing the tradition of the Christmas Bird Count, when the city leads the continent in participation. At Beaverhill Lake, a birdathon produced extra effort to find more species, and 151 species at one location, even a large one like Beaverhill, is an enviable situation.

There are more numbers. Six species not previously found on any count were recorded this year, bringing the cumulative total over the history of the count to 299. The reports of Greater White-fronted Goose (Lethbridge, Grande Prairie), Caspian Tern (Lethbridge), Vaux's Swift (Waterton), Yellow-bellied Flycatcher (Beaverhill, Devon, Medicine Hat), Wild Turkey and Mountain Plover (both at Medicine Hat) were apparently accompanied by sufficient documentation to satisfy local compilers, to whom I am grateful for their cooperation.

Many birdwatchers have commented that the timing of the count is crucial for numerical success. That may have been more true in the past than it is now, with counts conducted in many parts of the province. Back after a lengthy absence is a count conducted in Devon. The new count in Bindloss covers an area along the Saskatchewan border which contains an interesting species mixture. Beaverhill Lake is given its own count status in this report, because of its large contribution to shorebird numbers.

The following section lists information for each count including compiler or coordinator, participants, locations covered, distance and weather information, if provided. In addition, species which were seen during the week before the count, but not on the count weekend may be found here.

Lethbridge May 25 & 26. Teresa Dolman, 37 Carleton Rd. W, Lethbridge, AB T1X 3X4. Participants: Dale & Paul Baumback, Bruce & Lloyd Bennett, Anne, William & Bill Brown, Linda Cerney, Teresa & Doug Dolman, Witek & Andrew Gierulski, Maria Geppert, Bob Hall, Harcourt Hobbs, Alice Harper, Olga & Harold Hughs, Betty & George Luco, Laure Neish, Sheila Petherbridge, Doris Rhodes, Katherine & Frank Russell, Liz Savoy, Bill Sharp, Mary Thomson, Doug Walker, Joyce & Paul Wilkinson, Diana Williams. Areas covered: Botterill Park, Henderson Lake, Alexander Wilderness Park, Pavan Park, Elizabeth Hall Wetlands, Park Lake Prov. Park, Keho Lake, Stirling Lake, Jail Lake, Coaldale & area, McQuillan Lake, Taber Prov. Park, Taber, Chin, Horsefly & Fincastle Lakes, Six-mile Coulee to Sugarbowl Coulee, Russell farm & area, Luco & Rollingson riverbottom area, Tyrrell Lake, Rush Lake, Ridge Reservoir. Team hours 88 and team distance 493 km. Weather: May 25; 6-17C, wind SW at 32-48 km, dry. May 26; 5-15C, wind W 15-30 km, dry. Count week species: White-faced Ibis, Wood Duck, Eurasian Wigeon, Hooded Merganser, Black-necked Stilt, Ruddy Turnstone, Forester's Tern, American Pipit, Black & White Warbler.

Waterton June 1 & 2. Teresa Dolman. Participants: Dale & Paul Baumback, Teresa & Doug Dolman, Witek Gierulsky, Patty & Graeme Greenlee, Joel Hagen, Betty Haig, Waneeta McInnis, Lois McKillop, Sheila Peterbridge, Doris Rhodes, Shirley Sillito, Janice, Jesse & Fraser Smith, Doug Walker, Paul & Joyce Wilkinson. Areas covered: All major roads, buffalo paddock, Bertha Lake trail, Crandell Lake area, Waterton townsite, Linnett Lake, Vimy Trail, Snowshoe Trail, Maskinonge Lake. Team hours 33 and team distance 179 km. Weather: June 1; 8-22C, wind SW at 30 km, dry. June 2; 5-24C, wind SSW at 15 km, dry.

Cardston May 25 & 26. Teresa Dolman. Participants: Teresa & Doug Dolman, Shirley Sillito (count compiler). Team hours 18 and team distance 319 km. Weather: May 25; 8-15C, wind 5-20 km, dry. May 26 no information. Count week species: American White Pelican, Trumpeter Swan, Sandhill Crane.

Cypress Hills May 25 & 26. Kelty Otto, Cypress Hills Provincial Park, Box 12, Elkwater, AB T0J 1C0. Participants: Charles Mamo, Richard Foubert, Nancy Smith, Heidi Breier, Kelty Otto, Mike O'Shea, Phil Horch, Jeff Chorney, Craig Buchholz, Cresten Andersen, O'Brien Tarnasky, John Findlay, Allan & Fiona Couperwhite, Dawn Dickinson, J. & E. Watts, George Friedt, Tilley Cubs (Boy Scouts of Canada),Keith Bocking. Areas covered: Spruce Coulee, Reesor Lake, Ferguson Hill road to Willow Creek, Horseshoe Canyon Trail, north side of Elkwater Lake, south side of Elkwater Lake, Elkwater townsite, west of causeway, Elkwater townsite, east of causeway, Mitchell Creek Trail, Murray Hill road (from Hwy. 41 to pavement end). Team hours 25.5 and team distance 77 km. No information on weather conditions.

Claresholm May 25 & 26. Teresa Dolman. Participants: Ruth & Jason Attwell, Bill Burbank, Robin Chisholm, Hazel Hudson, Judy Lucas, Grace Norgard (count compiler), Al Williams. Team hours 46 and team distance 702 km. Count week species: Double-crested Cormorant, Osprey, Ruffed Grouse, Downy Woodpecker, Hairy Woodpecker, Olive-sided Flycatcher, Hermit Thrush, Warbling Vireo, Ovenbird, Rufous-sided Towhee, Common Grackle.

Medicine Hat May 26. Dennis Baresco, 580 First Street SE, Medicine Hat, AB T1A 8E6. Participants: Dennis Baresco, Kelly & Richard Bogle, Barb Chisholm, Dawn Dickinson, Corlaine & Rob Gardner, Phil Horch, Lex Karne, Luke Lindoe, Lorine Marshall, Val Martins, Garry Newton, Pat Owens, Mark Oxamitny, Dan & Mark Schiebelbein, Ivan Shukster, Charlene, Brent, Jemma & Shaun Skidmore, Ruth & Bill Tidy, Ben & Michael Velner. No area coverage information. Team hours 162, and team distance 563 km. Weather: 2-15C, near calm, “intermittent sun, cloud, rain, drizzle and hail. Also seen; Buteo (sp.) 12, White-headed Gulls 240.

Bindloss June 2. Michael O'Shea, Gen. Delivery, Bindloss, AB T0J 0H0. Participants: Wonnita Andrus, Phil Horch, Garry Newton, Michael O'Shea, Ivan Shukster. Areas covered: Bindloss townsite, Princess Springs, Red Deer River campground, Jody Minor Ranch. Team hours 8.5 and team distance 85 km. No weather information.

Banff-Canmore May 25. Mike McIvor, Box 114, Banff, AB T0L 0C0. Participants: Vicki Connoy, Peter Duck, Allan Hipkins, Diane & Mike McIvor, Mary & Bob Smith. Team hours 22.5 and team distance 127 km. Weather: 1-4C, wind 0-5 km, occasional showers of snow/rain.

Yamnuska May 26. Mike McIvor. Participants: Barbara Belyea, Peter Duck, Alan Hipkins, Diane & Mike McIvor, Mary & Bob Smith, Eva Zidek. Team hours 25 and team distance 77 km. Weather: 1-10C, wind 0-15 km, scattered light showers.

Calgary May 25 & 26. Jim Washbrook, 1056 Deer River Circle SE, Calgary, AB T2J 6Z7. Participants: Jim Baker, John Bargman, Brooke Clibbon, Ross Dickson, Olga Droppo, Jean & Rodger Dunn, Bev Dusseault, Angela Gottfred, Jeff Gottfred, Rhea & Dick Graham, Horst Grothman, Clay Hunt, Joanne Jamieson, Linda Joehnck, Kate Jones, Steve Kassai, Joan & Malcolm McDonald, Bill McKitterick, Lynne Moore, Jamey Podlubny, Kay Power, John Riddell, Peter Sherrington, Gwen Simpson, Andrew Slater, Ena Spalding, Elaine Spitzer, Milt Spitzer, Don & Phil Stiles, Bob Storms, Marilyn Strachan, Michael Tacon, Richard Thomas, Eric Tull, Suzanne Visser, Linda Walker, Robert Walker, Jim & Ted Washbrook, Allen Wiseley. Areas covered: City of Calgary (Lowery Gardens, Inglewood Bird Sanctuary, Glenmore Park), Irricana sloughs, Eagle Lake, Wyndham-Carseland Prov. Park, Dalemead Reservoir, McKinnon Flats, Bow Valley Prov. Park, Water Valley. No hours, distance or weather information provided. Count week species: Wood Duck.

Red Deer May 26. Myrna Pearman, Box 127, Sylvan Lake, AB T0M 1Z0. Participants: Dorothy & Geoff Broadbent, Mary Coughlin, Minnie Cunningham, Dorothy Dickson, Margaret & Erhling Glabais, Alvin Goetz, Helen & Herb Harris, Dorothy Hazlett, Carol & Erin Kelly, Frank Lind, Murray MacKay, Mike McNaughton, Maxine O'Riordan, Myrna Pearman, Barb & Albert Peck, Bonny Potter, Fred Schutz, Joan & Joanne Susut, Joan Whitecalf, Marjorie & Kerry Wood. Area coverage not given. Team hours 76 and team distance 430 km. No weather information.

Mirror May 26. Participants: Ann & Charles Bird, Max Capen, Bess Paterson. Areas covered: Bird farm and the Narrows both about 3 km ESE of Mirror. Weather: 10-17C, near calm, sunny. Count week pecies: Yellow-bellied Sapsucker.

Devon May 26. John Banks, Box 53, Devon, AB T0C 1E0. Participants: John Banks, Louis Hochachka. Areas covered: Devon townsite, Devon Botanical Gardens, Clifford Lee Bird Sanctuary. Team hours 11 and team distance 50 km. Weather: 8-20C, winds light, dry. Count week species: Mourning Dove, Ruby-throated Hummingbird, Brewer's Blackbird.

Beaverhill Lake May 25 & 26. Roy Fairweather, R.R. #2, Tofield, AB T0B 4J0. Participants: Karen Aldred, Martin Bailey, Mike Breauer, Jim Christie, Selena Cole, Dick Dekker, Karen Dudley, Rainer Ebel, Roy Fairweather, Frank Fraser, Brian Hornby, Darrell Hutchinson, Jeanne & Edgar T. Jones, Stefan Junkind, Steve Lane, Jim Lange, Craig Machtans, Scott Millar, Pat Nolan, Elson Olorenshaw, Petra Stubbs. Team hours

70 and team distance 342 km. Weather: May 25; 7C, wind 25 km, drizzle & rain May 26; 15C, wind 0-5 km, sunny. Count week species: Great Egret, Sharp-shinned Hawk, Western Tanager, Red-breasted Nuthatch, Solitary Vireo, Northern Rough-winged Swallow, Gray-cheeked Thrush.

Edmonton May 25 & 26. Jim Lange, 13216 - 128 Avenue, Edmonton, AB T5L 3H2. Participants: Karen Aldred, Martin Bailey, Roger Belley, Karen Blumhagen, Jean Burgess, Bob & Jan Carroll, George & Jackie Christianson, Jim Christie, Selena Cole, Patsy Cotterill, Dick Dekker, Peter Demulder, Karen Dudley, Rainer Ebel, Roger Edwards, P.J. Fairfield, Roy Fairweather, Marilyn Florence, Alice & Orst Forchut, Frank Fraser, Pat Fritz, Dave Geddes, Shannon Gunn, Alice Hendry, Alan Hingston, Leni & John Honsaker, Brian Hornby, Barbara, Chantel & Geneva Hughes, Jeanne & Edgar T. Jones, Stefan Junkind, Bob & Gail Lane, Steve Lane, Jim Lange, Craig Machtans, Moira McColl, Trudy & Kevin McKenzie, Phyllis & Scott Millar, Rick Morse, Pat Nolan, Elson Olorenshaw, Jack Park, Dave Pick, Heather & Dave Pinnell, Dianne & Bob Reckhow, Nancy & Lynn Reckhow, Fred Resler, Aileen Rodes, Doreen Row, Cathy Ruim, Gary & Luke Smith, Petra Stubbs, Margo Wesloski, Claire & Nina Williams, Bernice Young. Areas covered: Elk Island National Park, Vegreville, Big Lake, Hastings Lake, Wagner Natural Area. Team hours 54 and team distance 320 km. Weather: May 25; high 25C, winds 25 kmh, light rain then clearing. May 26; high 18C, strong W winds dropping to calm, sunny.

Grande Prairie May 25 & 26. Ellen Craig R.R. #1, Wembley, AB T0H 3S0. Participants: Ellen & Gavin Craig. Areas covered: Hermit, Bear, Saskatoon, Uswells and Cutbank Lakes. Team hours 24 and team distance 130 km. Weather: May 25; high 12C, SW wind, sunny. May 26; high 11C, SW wind, partly cloudy.

LEGEND

LETH - Lethbridge
WATE - Waterton
CARD - Cardston
CYPR - Cypress Hills
CLAR - Claresholm
MEDI - Medicine Hat
BIND - Bindloss
BANF - Banff-Canmore
YAMN - Yamnuska
CALG - Calgary
MIRR - Mirror
REDD - Red Deer
BEAV - Beaverhill Lake
DEVO - Devon
EDMO - Edmonton
GRAN - Grande Prairie

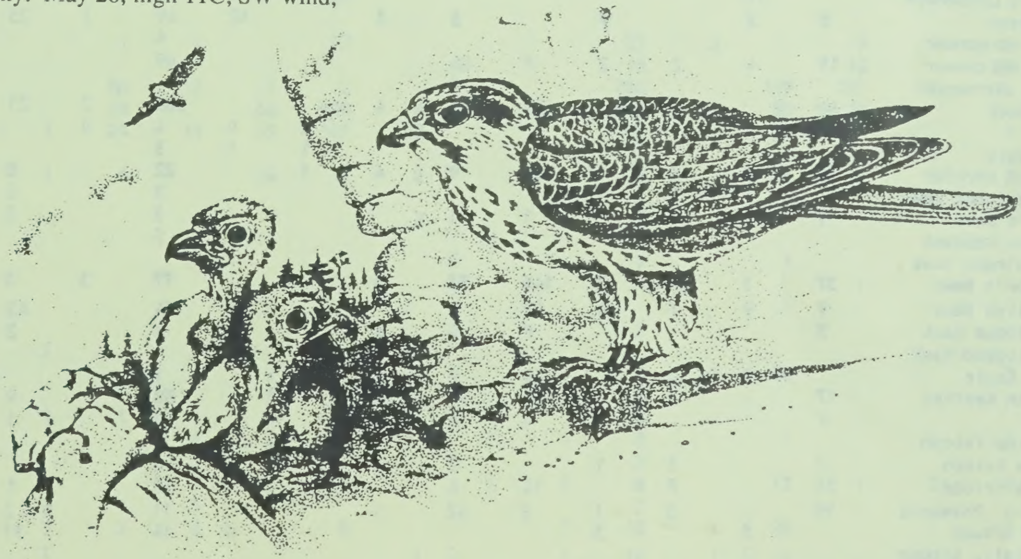

Table 1. 1991 MAY SPECIES COUNT - BIRDS

Species	LETH	WATE	CARD	CYPR	CLAR	MEDI	BIND	BANF	YAMN	CALG	MIRR	REDD	BEAV	BEVO	EDMO	GRAN
Common Loon	2	1	3	1				2	1	6		3			5	2
Pied-billed Grebe	9	2	1			1				9		6	3	8	8	9
Horned Grebe	115		5	8						21	0	12	29	2	14	1
Red-necked Grebe	5		15	16				4		84		16		5	90	17
Eared Grebe	293		2	14	25	30	36			170	1	31	237	6	920	451
Western Grebe	21		1	8	2	2				57			39		20	16
Am. White Pelican	99					77				56	30		145		34	
Dbl.-cr. Cormorant	53		14	1		7	2			26			29		61	
American Bittern							1			2		2	12	1	2	1
Great Blue Heron	9	3	2		3	28				30	1	7	13		10	
Blk.-cr. Night Heron	1									26			51		14	
Tundra Swan													13			
Trumpeter Swan										5			0		4	7
Gr. White-fr. Goose	1															1
Snow Goose	3															
Ross' Goose										1						
Canada Goose	1,244	41	351	22	175	733	34	64	2	686	11	207	141	7	119	151
Wood Duck						2										
Green-winged Teal	14	4		2	22	6	6	9		21	3	6	11	1	26	4
Mallard	428	43	73	18	99	260	18	35	22	542	7	154	237	10	294	1,173
Northern Pintail	116		24	2	23	68	8			47		15	39		32	107
Garganey	1															
Blue-winged Teal	218	7	81	5	57	121	38	11	2	651	22	87	262	4	411	29
Cinnamon Teal	32	6	23	1	3	8		4	2	84		6	11		11	1
Northern Shoveler	175		37	2	43	87	5	1		387	7	20	195	2	162	83
Gadwall	94		27	2	68	35	29	2		179		13	55		54	42
Eurasian Wigeon																1
American Wigeon	68	3	22	14	9	17	7			75	2	30	19	6	63	203
Canvasback	92	1	8	7	6	21	4			444	1	14	18	1	48	64
Redhead	134		12	3	6	13	4			168	2	17	86	14	131	14
Ring-necked Duck	5	16	13	18		6	2	18	4	20	2	3		12	19	1
Greater Scaup	1					4										
Lesser Scaup	258		24	19	29	33	16		8	400	8	64	196	49	217	603
Harlequin Duck		2														
Oldsquaw										1						
Surf Scoter										1			1			8
White- w. Scoter	8			7						14		2	1		18	181
Common Goldeneye	11					5		46		51		8	10	6	49	2
Barrow's Goldeneye		11							4	3					189	4
Bufflehead	8	2		7		3	3		12	69	1	23	28	19		35
Hooded Merganser										4			4			
Common Merganser	13	4	2	2	7	26				49			3			7
Red-br. Merganser						1									10	1
Ruddy Duck	60		5		20	27	4			386	2	21	134	18	190	12
Osprey	1	2						2	0	4	0					
Bald Eagle								1	1	3					2	
Northern Harrier	20	2	9		14	9	4	1		22		8	14		1	2
Sharp-shinned Hawk		1	1	1						2		3				
Cooper's Hawk	1				1	1				2		2	1		1	
Northern Goshawk										5			1		1	
Broad-winged Hawk						3			2						3	
Swainson's Hawk	37	1	32	2	144	32	5			77	3	3	13		3	1
Red-tailed Hawk	9	9	7	6	43	5			3	74		43	25		16	5
Ferruginous Hawk	3				8	5	3			3		2				
Rough-legged Hawk													1			
Golden Eagle		1	1		4	2	1			1						
American Kestrel	17		2	1	15	51	7	1		30		9	2	1	1	5
Merlin	2			1	4	6				10		1	2			
Peregrine Falcon										1						
Prairie Falcon	2		1	1		2	1			6						
Gray Partridge	33		2		13	4				19		1				
Ringed-n. Pheasant	19		3	1	8	42	1			11		3	4			
Ruffed Grouse		5		3					6	14		11	5		9	4
Sharp-tail. Grouse		2				2										
Wild Turkey				2		4										
Yellow Rail										1						
Virginia Rail															1	
Sora	9	3	4	4		1	1	1	2	35	3	6	32	6	17	3

Table 1. 1991 MAY SPECIES COUNT - BIRDS

Species	LETH	WATE	CARD	CYPR	CLAR	MEDI	BIND	BANF	YAMN	CALG	MIRR	REDD	BEAV	BEVO	EDMO	GRAN
American Coot	784		34	9	34	29	14	6	2	300	43	199	99	44	447	67
Sandhill Crane		1								1		2	1			
Black-bel. Plover	314									476			433			
Less. Golden Plover										1			86			
Semipalm. Plover						5							1			
Piping Plover	2															
Killdeer	62	2	25	3	27	61	14	1	1	67	3	36	38	3	17	3
Mountain Plover						1										
American Avocet	153		18		19	4	19			214	1	3	47		5	
Greater Yellowlegs					1										1	
Lesser Yellowlegs	1									5	2		18		4	
Solitary Sandpiper													1		6	
Willet	29		8	2	13	31	6			42			40		1	
Spotted Sandpiper	20	6	27	3	12	15	1	9	7	108		3	4	7	39	
Upland Sandpiper	2		6	2	2	1	1			9					1	
Whimbrel										4			3			
Long-billed Curlew	14		8		16	10	19									
Marbled Godwit	31		6		5	12	18			47			55	1		
Ruddy Turnstone													37			
Red Knot										2			75			
Sanderling	100												21			
Semipalm. Sandpiper	7									6			184		4	
Least Sandpiper	2												25		1	
White-r. Sandpiper													36			
Baird's Sandpiper	22												9			
Pectoral Sandpiper										3			180		1	
Dunlin													3			
Stilt Sandpiper										1			24		1	
Buff-br. Sandpiper													40			
Short-b. Dowitcher										5			7			
Long-b. Dowitcher	14									7			1			7
Common Snipe	3	11	19	11	7			8	6	25	2	6	36	2	24	4
Wilson's Phalarope	243	1	60	1	55	43	18	9		132			145		3	
Red-neck. Phalarope	1									4			6		500	
Franklin's Gull	392		2	3		256				825		211	601	1	10,000	2,140
Bonaparte's Gull	1									223			6		10	
Ring-billed Gull	377	25	92	10	17	197	4			745		4	218	1	67	6
California Gull	252		20	51		184				2,020			27		11	32
Herring Gull	1					21										5
Caspian Tern	3															
Common Tern	26		1	4		17				31	2		9		98	
Forster's Tern										10			13		28	
Black Tern	7		86	12	21	2				286		119	281	57	686	266
Rock Dove	119		48		68	998	8			102	10	80	36		64	
Mourning Dove	113	1	24	11	35	102	22			23		2	1		2	
Black-bill. Cuckoo														1		
Great Horned Owl	13	1	6		24	1	2			3		5	4		2	7
Northern Hawk Owl																1
Burrowing Owl					9		2			3						
Barred Owl								1								
Great Gray Owl										7		1				
Short-eared Owl													1			
N. Saw-whet Owl												2				
Common Nighthawk										2					1	
Vaux's Swift		2														
Ruby-t. Hummingbird					2					2	1	26			3	
Calli. Hummingbird					2				1	1						
Ruf. Hummingbird		9	1		4			1		4						
Belted Kingfisher	8			4	2	3		1	1	3		1			2	
Lewis's Woodpecker										2						
Yellow-b. Sapsucker				1	2	1		1	5	8		13	1	2	9	
Red-naped Sapsucker		3	1	5						2						
Downy Woodpecker	3	3	2	2		8			1	10	1	20		1	8	2
Hairy Woodpecker	2	3					1		1	10	1	16	1	1	8	2
Black-b. Woodpecker												2				
Three-t. Woodpecker				1												
Northern Flicker	23	4	10	3	8	30		1	1	41	4	11	7	1	6	5
Pileated Woodpecker		1						1		4		8		1	1	

Table 1. 1991 MAY SPECIES COUNT - BIRDS

Species	LETH	WATE	CARD	CYPR	CLAR	MEDI	BIND	BANF	YAMN	CALG	MIRR	REDD	BEAV	BEVO	EDMO	GRAN
Olive-s. Flycatcher		1		2					1	10		1	1	1	1	
Western Wood Peewee	14	2		1	12	3	1	1		77	1	4	5		1	1
Yellow-b. Flycatcher						2							1	1		
Alder Flycatcher										7			74		1	
Willow Flycatcher	3	3			1											
Least Flycatcher	72	21	27	28	3	16	2		12	244	100	41	211	18	104	4
Hammond Flycatcher		1														
Dusky Flycatcher		7		1												
Eastern Phoebe	1									7		8	3	2	6	
Say's Phoebe	1				2					5						
Great-c. Flycatcher												1				
Western Kingbird	72			1	19	106	9			4						3
Eastern Kingbird	111	5	32	3	46	118	10			75	5	17	9	2	11	
Horned Lark	144		26		339	426	118			21			2			
Purple Martin											15	19	7		21	
Tree Swallow	28	49	48	20	96	30		6	8	370	17	141	204	9	162	19
Voilet-green Swallow		7				8		4	6							
N. Rough-w. Swallow	58		6	3	13	6	6	3	4	165		2				
Bank Swallow	129		14	71	25	444	8	4		255		13		2	72	
Cliff Swallow	293	535	183		237	43		3	2	456	18	352	122		114	200
Barn Swallow	60	15	27	10	64	153	18	2	4	187	20	51	72	3	51	10
Gray Jay		2			17			1	3	5		15				6
Steller's Jay		1														
Blue Jay					3					7		20	1	5	22	4
Clark's Nutcracker		1			7											
Black-billed Magpie	128	5	38	10	101	491	36	5		277	8	62	46	10	50	26
American Crow	66	12	29	13	84	68	46	7	1	170	4	101	66	12	53	59
Common Raven		8	4		35			4	6	25		8	3	1	2	
Black-c. Chickadee	10	11	3	25		15		1	1	98	3	79	4	5	21	6
Mtn. Chickadee		1														
Boreal Chickadee		3								2		29			4	
Red-br. Nuthatch	4	34	1	4	7	4		4	3	35		8		3	11	
White-br. Nuthatch		1								9		12			2	
Brown Creeper										1						
Rock Wren	6					18										
House Wren	155	18	39	15	40	129	9		5	137	13	44	34	11	57	1
Winter Wren		2														
Marsh Wren	6									14	2		10		1	
Golden-cr. Kinglet		2						2		5						
Ruby-cr. Kinglet	4	54	2	14	3			14	11	23		9	2		8	
Mountain Bluebird	38	5	24	2	54			2	4	18	2	97	5		9	
Townsend's Solitaire				4	2				1							
Veery	10	1	1			3				9			2			
Gray-cheek. Thrush	1															4
Swainson's Thrush	49	5	21		38	17		3	4	72		2	49	9	8	
Hermit Thrush									5	4					5	5
American Robin	208	79	84	56	96	297	11	9	8	295	15	107	47	13	147	38
Varied Thrush		2						2		1						
Gray Catbird	28		2		10	2	2			17		4	1	4	2	
Brown Thrasher	11				11	59	6			3						
American Pipit								27								
Sprague's Pipit	4				1					6			5		3	
Bohemian Waxwing					1				1							
Cedar Waxwing	46	7		44	18	15	9			6		10				
Loggerhead Shrike	1				1	2	8			1						
European Starling	351	12	146	2	302	761	78	1		412	11	61	62	3	103	3
Solitary Vireo				1	2				1	1				2	1	
Warbling Vireo	6	29		5		18	1	1	2	33	1	5	33	5	10	
Philadelphia Vireo					1								4	1		
Red-eyed Vireo	2			6	1	1				12		11	9	7	22	1
Tennessee Warbler				1	1					32		1	32	3	11	4
Orange-cr. Warbler	1	2		8	2			9	5	12						
Yellow Warbler	77	83	48	11	34	242	9	2	3	261		22	164	15	85	22
Magnolia Warbler										3			9	1	2	
Yellow-rump. Warbler	10	27	8	34	3	1		9	7	38		4	10	2	2	8
Townsend's Warbler		15						6								
Bl.-th.-gr. Warbler																
Palm Warbler													1			
Blackpoll Warbler	1				2										1	
										16		1	23	1	1	

Table 1. 1991 MAY SPECIES COUNT - BIRDS

Species	LETH	WATE	CARD	CYPR	CLAR	MEDI	BIND	BANF	YAMN	CALG	MIRR	REDD	BEAV	BEVO	EDMO	GRAN
B.& W. Warbler											1	3				
American Redstart				14	3				1	10			33	3	1	
Ovenbird				3		1			2	9		1	2	2	14	
Northern Waterthrush		1		1	2			8	3				8			
Conn. Warbler										5			1		7	
Mourning Warbler													1	1	2	
MacGill. Warbler		19		5	1											
Common Yellowthroat	19	3	8	36	4	29	3	5	2	34		2	16	1	19	
Wilson's Warbler	2	15		2	1	2		8		15			10	2	1	1
Canada Warbler													3	3	1	
Yellow-breasted Chat						2										
Western Tanager	1	4		2						24		1		6		
Rose-br. Grosbeak	3				2	1				14		9	10	8	9	3
Black-head. Grosbeak		5	1													
Lazuli Bunting				1		1										
Rufous-s. Towhee	17					50	3									
Am. Tree Sparrow				1									1			
Chipping Sparrow	173	36	29	33	113	22		70	30	518		11	8	8	21	5
Clay-colored Sparrow	54	14	7	2	28	65	6			350	10	52	144	7	83	
Brewer's Sparrow	7					2										
Vesper Sparrow	78	10	12	2	107	37	21	2		59	9	24	15		7	5
Lark Sparrow	39					83	3									
Lark Bunting	8					17	10									
Savannah Sparrow	45	8	24	10	118	21	3	5	2	247	2	29	150	3	35	91
Baird's Sparrow	3			1		7				1						
Grasshopper Sparrow				4			2									
Leconte's Sparrow	2					2				11		14	35	3	7	
Sharp-tail Sparrow													10			
Fox Sparrow		2								2						
Song Sparrow	12	9	5	5		5		2	2	43	5	34	13	3	34	
Lincoln's Sparrow	1				1			10	7	15			3	3	21	
Swamp Sparrow													1		4	
W.-throated Sparrow					1	1			1	39		18	2	7	50	8
W.-crowned Sparrow	3	23	9	20	17	3		15	4	12			4			
.-crowned Sparrow										1						
ark-eyed Junco	1	12		26	9			7	6	22		19		4	6	5
cCown's Longspur							10									
hes.-col. Longspur	57				4		27									
obolink						1				1			26			
ed-wing. Blackbird	313	63	133	54	87	389	8	16	10	913	30	212	526	51	749	194
estern Meadowlark	164		47	9	85	383	107			84		20	20		5	
ellow-h. Blackbird	858	4	87	40	8	284	5	1		1,028	10	50	128	30	320	20
rewer's Blackbird	234	47	34	34	113	104	33			249		82	117		6	9
ommon Grackle	37		2	1		122				7		15	6		43	2
rown-h. Cowbird	105	19	23	28	151	110	33	10	8	179	6	34	58	14	91	16
orthern Oriole	55		12	6	21	86				134	40	63	61	12	135	7
urple Finch										9		18		3	12	5
ed Crossbill										13		13		3	1	
hite-w. Crossbill										1						
ine Siskin		8				1		6		42		1			1	
merican Goldfinch	43	31	45	20	25	36	16			64		45	21	6	8	
ine Grosbeak				1												
vening Grosbeak						1				8		8			2	3
ouse Sparrow	224		139	2	240	897	60			183	10	99	45	6	68	
otal Birds	11,633	1,646	2,740	1,097	4,103	10,103	1,124	539	284	19,210	532	3,866	7,787	637	18,293	6,602
otal Species	144	97	93	107	111	129	76	68	63	183	53	119	151	84	145	87
bservers	2	20	3	20	9	26	5	7	8	44	4	27	22	2	71	2

Mammals

Birds received most of the attention during the non-flower count, but some ''naturalists'' remembered there are other interesting animals in Alberta. Twenty-eight mammal species - another record - were reported in 1991. The small ones like voles, shrews and mice were notably absent.

Bison, including the Plains and Wood varieties, were reported at Elk Island National Park. All other species were free-roaming.

No list as such was turned in from Calgary, but one group of counters found a Raccoon at McKinnon Flats just a few kilometres from the southern city limit. This species had been considered to be restricted to the extreme southern portion of Alberta.

Reports of Gray Wolf and Grizzly tracks along a trapline near Wembley and the sighting of a Grizzly in Waterton National Park make the regional reports even more interesting to read. As a final note, nature watchers are encouraged to keep alert for American Badger, a species that may be in decline.

LEGEND

LETH - Lethbridge
WATE - Waterton
CLAR - Claresholm
CALG - Calgary
REDD - Red Deer
EDMO - Edmonton
GRAN - Grande Prairie
X - species seen
tr - tracks seen

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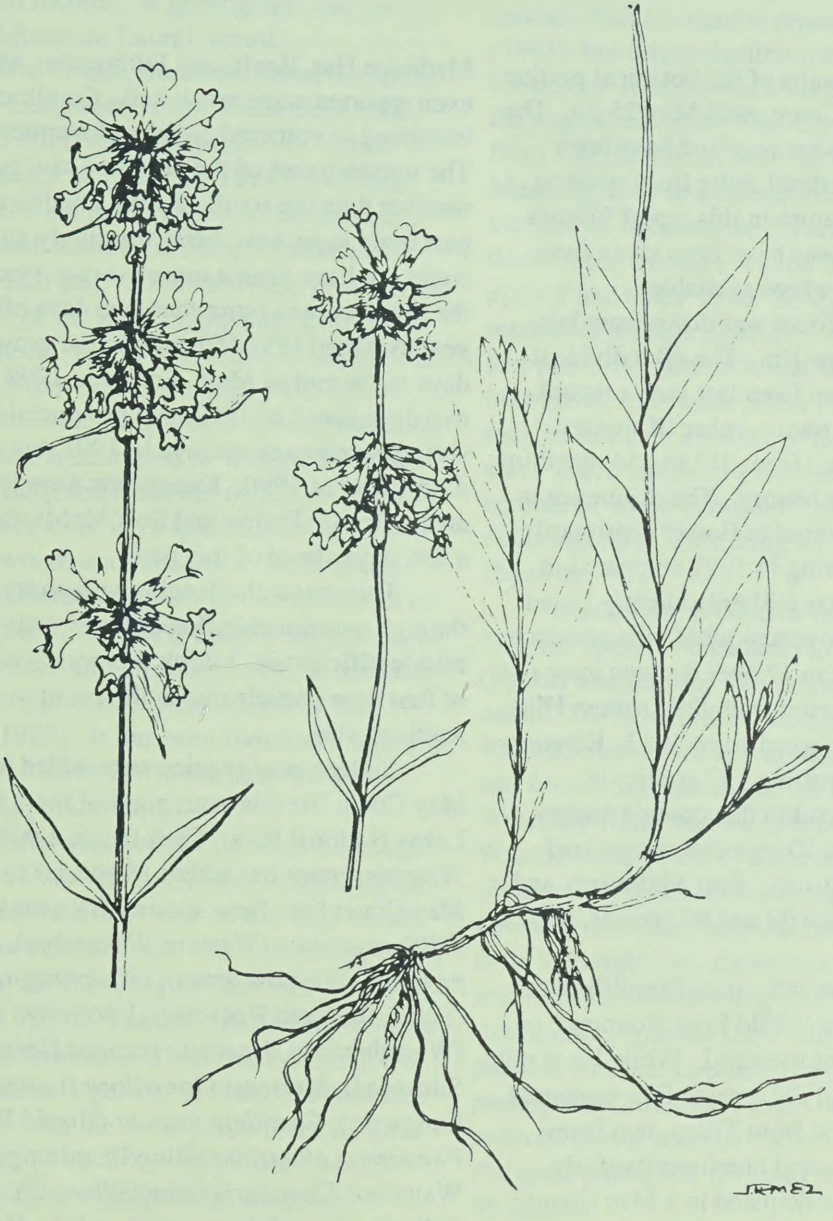
Table 2. Mammals observed during the count weekend.

	LETH	WATE	CLAR	CALG	REDD	EDMO	GRAN
Bison						X	
Mule Deer	X	X	X		X		
White-tailed Deer	X	X			X	X	
Moose		X			X	X	X
Elk			X			X	
Bighorn Sheep		X					
Grey Wolf							tr
Coyote		X	X		X		
Red Fox	X		X		X		
Grizzly Bear		X					tr
Black Bear					tr		
Raccoon				X			
Striped Skunk			X				
Pine Marten		X					
American Badger			X				
Groundhog					X		
Yellow-bellied Marmot	X						
Richardson's Gr. Squirrel	X		X			X	
Columbian Gr. Squirrel	X	X					
Red Squirrel					X	X	
N. Flying Squirrel					X		
Least Chipmunk		X					
Porcupine	X						
Beaver	X					X	
Muskrat	X		X		X	X	
Snowshoe Hare					X	X	X
Nuttall's Cottontail	X						
White-tailed Jackrabbit	X		X		X		



Slender Blue Beard-tongue *(Penstemon procerus)*

Results of the 1991 May Species Count - Plants in Flower

J. Derek Johnson

Following are the results of the botanical portion of the 1991 May Species Count, held May 25-26. The areas from which reports were received have been listed in approximate latitudinal order from south to north. Scientific nomenclature in this report follows Moss (1983); common names have been taken from Looman and Best (1979), where available.

Participation in the count was down from last year's record high of 132 to 106. The 40 individual reports submitted was down from last year's record high of 46. However, the total number of species reported in flower increased from 317 to 336, the third highest total in the count's history. The difference in the number of species reported in flower is primarily due to a slightly earlier spring in 1991 compared to the last two years, but it was still only slightly ahead of average. Geographic coverage within the province fell to 15 areas, compared to 17 over the past three years. No report was received from the Cypress Hills, interrupting a continuous record since 1983. Edmonton led all count areas, reporting 152 species in flower, the third highest total in this count's history. Calgary came second with 101 species, the second best total in this count's history. Fort McMurray and Whiskey Gap followed with 92 and 90 species, respectively.

The May Count received a plug from Elisabeth Beaubien on CBC Radio's ''Wild Rose Country'' on the Friday before the count weekend. While I was not deluged with phone calls, I did receive five responses from this effort. One came from Tilley, two from Calgary, one from Devon, and one from Ranfurly. None of the callers had participated in a May Count before. A couple of the people seemed quite keen and may become regular participants in the future. Weather on the count weekend was highly variable across the province. About the only consistent comment was that it was cool. Sunday proved to be a more accommodating day than Saturday. Saturday was generally cool and cloudy with rain reported in Medicine Hat, Banff, and Edmonton. Medicine Hat even reported some small hail. Conditions on Sunday improved to scattered cloud and warmer temperatures. The northern part of the province saw generally better weather than the south. Spring conditions over the past three years have been amazingly similar. 1990 could not have been a more average year. No area of the province was more than two days off of the 30-year average (1951-80) cumulative growing degree-days to the end of May. Spring in 1990 was about two days ahead of 1989 on a provincial basis. Spring was again close to average in 1991, but a couple of days ahead of 1990. Exceptions were the northern areas, Grande Prairie and Fort McMurray, which were a few days ahead of this pace.

This was a challenging year to try and sort through questionable flowering records and probable misidentifications. I think this was due to the number of first time participants in the count as much as anything else.

Sixteen new species were added to the all-time May Count list this year, eight of them from Waterton Lakes National Park. Over the past three years the Waterton count has added 18 species to the all-time May Count list. New species this year included: *Trillium ovatum* (Western Wakerobin), *Draba paysonii* (Whitlow-grass), *Lithophragma parviflora* (Small-flowered Rockstar), *Vaccinium myrtillus* (Whortleberry), *Hackelia jessicae* (Jessica's Stickseed), *Mertensia longiflora* (Large-flowered Lungwort), *Castilleja hispida* (Hispid Paintbrush), and *Penstemon albertinus* (Blue Beardtongue) from Waterton; *Eleocharis quinqueflora* (Few-flowered Spike Rush) and *Antennaria umbrinella* (Brown-bracted Mountain Everlasting) from Whiskey Gap; *Chrysosplenium tetrandrum* (Golden Saxifrage) from Calgary; *Neslia paniculata* (Ball Mustard) and *Oxycoccus quadripetalus* (Small Bog Cranberry) from Edmonton; *Kalmia microphylla* (Mountain Laurel) from Tanghe Creek northwest of Manning; and

Ranunculus circinatus (White Watercrowfoot) and *Cypripedium acaule* (Stemless Lady's-slipper) from Fort McMurray. Specimens were provided for the Mountain Everlasting, Spike Rush, Golden Saxifrage, and Ball Mustard records. A photograph was provided with the Mountain Laurel record.

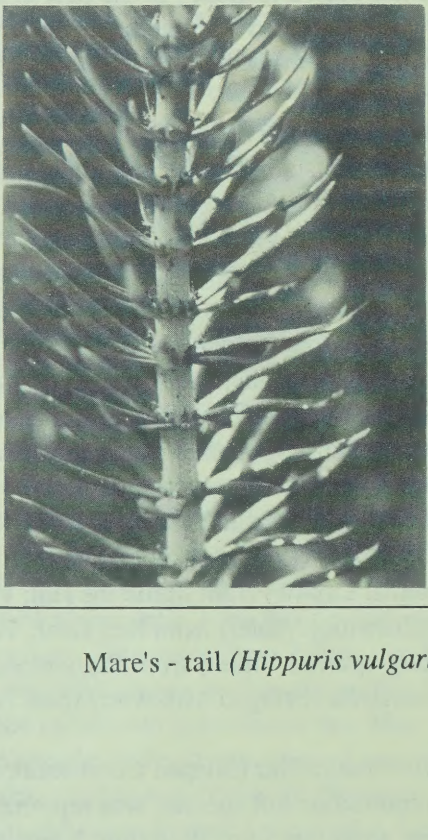
Western Wakerobin, Small-flowered Rockstar, Large-flowered Lungwort, Hispid Paintbrush, and Stemless Lady's-slipper are considered to be rare in the province (Packer and Bradley 1984). Western Wakerobin, one of the rarest plants in the province, occurs in protected, somewhat damp locations in semi-shade and rich soil. It is found only in Waterton Park and has one of the most interesting histories of any plant in Alberta. It was first found in the park in 1915, but not rediscovered there until 1973 (Kuijt 1982). Large-flowered Lungwort, a species found on moist, open slopes, is restricted to Waterton Park in Alberta. Small-flowered Rockstar occurs on gravelly to grassy montanes slopes. Hispid Paintbrush is a species of open woods and meadows. Both species occur in a few scattered locations in the mountains of southwestern Alberta. Stemless Lady's-slipper can be found in bogs, woods and on sand dunes. It occurs in a few locations in the northeastern corner of the province (Moss 1983). It has been found in a few new areas around Fort McMurray in the past few years (Marion Horrocks pers. comm.).

Chrysosplenium tetrandrum (Golden Saxifrage) closely resembles *C. iowense* (Golden Saxifrage), the species usually reported in flower on the May Count. The two species occur in similar habitats, moist, shady banks and ledges, but the latter is more common than the former (Moss 1983). The two species differ in the size of the central flowers (2-3 mm vs. 3-5 mm), the color and shape of the sepals (green and of equal size vs. golden-yellow with the outer pair wider), and the number of stamens (4 vs. 2-8). May Count participants should keep their eyes open for the possible presence of both species in their area. The first report of *Oxycoccus quadripetalus* (Small Bog Cranberry) for the May Count is no great surprise. I think it may often be overlooked or simply lumped in with *O. microcarpus*. However, the latter species is much more common than the former (Moss 1983). The two species can be separated on the basis of the longer, wider, less revolute leaves, puberulent pedicels, and larger fruits of the former. Both species occur on moss in boggy situations. Again, participants should keep their eyes open for both species when doing their counts. Ball Mustard is reported as common by Moss (1983), but this is the first time I have seen it in the Edmonton area. It was abundant and widespread in the region this year. The report of Mountain Laurel from Tanghe Creek, near the B.C. border northwest of Manning, falls in a conspicuous gap in the range of the species between the records in western Alberta and those in the southern Yukon Territory (Moss 1983; Porsild and Cody 1980; Scoggan 1979). This report represents a range extension worthy of comment. The fact that the report of White Watercrowfoot from Fort McMurray represents a first record for the May Count may be as much a matter of taxonomy as anything else. There has been a tendency in the past to lump records of white-flowered "buttercups" into *Ranunculus aquatilis,* something which the authors of some floras do.

In addition to the five species mentioned above, 13 other species considered to be rare in the province (Packer and Bradley 1984) were found on the 1991 count. These include: *Viola glabella* (Yellow Wood Violet), *Hydrophyllum capitatum* (Woollen-breeches), and *Lonicera utahensis* (Utah Honeysuckle) from Waterton; *Ribes inerme* (Mountain Gooseberry) from Waterton and Whiskey Gap; *Ribes viscosissimum* (Sticky Currant), *Oxytropis lagopus* (Hare-footed Locowood) and *Erigeron radicatus* (Dwarf Fleabane) from Whiskey Gap; *Castilleja cusickii* (Yellow Paintbrush) from Whiskey Gap and the Milk River Ridge; *Astragalus lotiflorus* (Low Milk-vetch) and *Lupinus pusillus* (Annual Lupine) from Medicine Hat; *Viola pedatifida* (Crowfoot Violet) from Red Deer; *Viola selkirkii* (Long-spurred Violet) from Edmonton; and *Polygala paucifolia* (Fringed Milkwort) from Fort McMurray.

Corallorhiza striata (Striped Coral-root), an infrequently reported orchid species, was reported from a record three areas this year, Waterton, Yamnuska, and Grande Prairie. This is the first time it has been reported in flower from areas other than Yamnuska and the Cypress Hills on the May Count.

Alopecurus pratensis (Meadow Foxtail), a supposedly rare introduced forage grass (Looman and Best 1979), was found in flower on the May Count in the Edmonton area this year. Sightings of this species have become more frequent in the area over the past couple of years, especially along Highways 16, 16X, and 43 west of the city. I am wondering if its recent increase in abundance is because it is being included in seed mixtures used to revegetate areas along these highways. A non-flowering specimen of this species was also submitted with the results from the Fort McMurray count this year.



Mare's - tail *(Hippuris vulgaris)*

Following is the list of observers, area totals (1990 in brackets), and other pertinent remarks for each area.

1. Waterton Lakes National Park: The third consecutive count in this area involved three groups who visited the park on separate occasions. A group led by park naturalist Janice Smith did their count on the May Count weekend and found 53 (37) species in flower. Joel Hagen and Waneeta McInnis accompanied Janice on this count. On June 1 a group led by Lois McKillop visited the park encountering 30 species in flower. Betty Haig, Sheila Petherbridge, and Doris Rhodes joined Lois on this count. Sandra Kennedy, on a solo effort, reported 51 species in flower. The total number of species observed in flower in the park was 74 (55), the most in this count's three-year history.

2. Whiskey Gap: Barbara and Lynn Sommerfeldt, on their sixth consecutive count in this area, submitted a list of 90 (105) species in flower, the lowest total since the first year of their count in 1986. However, finding several rare species kept the count interesting.

3. Lethbridge: Three reports were submitted from the general Lethbridge area. Linda Cerney and Liz Savoy found 10 (8) species in flower in the Tyrrell-Rush lakes area southeast of the city and 18 (20) species along the Milk River Ridge south of the city. Frank and Katharine Russell and Diana Williams listed 10 species from the Russell farm south of the city. Lloyd Bennett, doing a count in the Taber area, reported 32 species in flower. The report of *Prunus pensylvanica* (Pin Cherry) from Taber, if correct, is particularly noteworthy as this species occurs very rarely out into the prairies. The species total for the Lethbridge area was 45 (59).

4. Medicine Hat: The May Count in this area continues to grow. Fifty-five (49) species were reported in flower this year, the most ever in the six years that a count has been done in this area. The 16 participants included Dennis Baresco (compiler), Kelly and Richard Bogle, Barb Chisholm, Dawn Dickinson, Corlaine and Rob Gardner, Lex Karne, Luke Lindoe, Lorine Marshall, Garry Newton, Pat Owens, Brent and Charlene Skidmore, and Bill and Ruth Tidy. Due to intense lobbying pressure from the Medicine Hat group, I have decided to include *Solanum dulcamara* (Bittersweet) on the May Count list. It was first reported in flower from this area last year.

5. Calgary: Seven reports, including 12 participants, arrived from Calgary this year. This is the best participation in the Calgary count since 1984. The increased participation and greater area coverage resulted in a total of 101 (61) species observed in flower, second only to the 118 species reported in 1981. Marilyn Strachan and her husband saw three species in flower while searching for birds on their property just west of the city limits. Ena Spalding covered two areas, finding 28 species in flower in the Springbank area west of the city and 27 species in Lowery Gardens and Edworthy Park along the Bow River within the city. Bev Dusseault and friend, and Robert and Lyn Walker included three species from Wild Rose Estates at Bragg Creek. May 27 and May 30 visits to the Bragg Creek Natural Area revealed a total of 35 species in flower to Jane Lancaster and Patricia Stansfield. On his third visit to Wyndham Provincial Park near Carseland, Gordon Kerr spotted 34 (39) species in flower. Don Stiles covered some of his usual haunts reporting 10 (21) species from Carburn Park, Beaverdam Flats, and south to the Deerfoot Bridge; 16 species from his East Didsbury Bluebird Trail; and 21 (25) species from the Bow River area below Queensland. Olga Droppo and her Wildflower Identification Course encountered 51 species at Archie and Janet Hogg Park west of Longview. Two infrequently reported species were found on this count, *Ranunculus reptans* (Creeping Spearwort) and *Ellisia nyctelea* (Waterpod). Creeping Spearwort was last reported from Whiskey Gap in 1987 and Waterpod was last seen on the Cypress Hills count in 1985.

6. Yamnuska: The number of species observed in flower in this area over the past three years has not varied greatly, indicating that spring conditions have been relatively consistent over this period. Sixty-four (63) species were observed in flower this year by Barbara Belya, Peter Duck, Alan Hipkins, Diane (compiler) and Mike McIvor, and Bob and Mary Smith. This area outdid themselves this year by reporting a record total of five *Draba* (Whitlow-grass) species in flower.

7. Banff/Canmore: Like Yamnuska, the number of species in flower in this area over the past three years has been quite consistent. This year, Vicki Connoy, Peter Duck, Alan Hipkins, Diane (compiler) and Mike McIvor, and Bob and Mary Smith saw 55 (55) species in flower. The introduced population of *Nasturtium officinale* (Water Cress) continues to flourish near Banff.

8. Red Deer: The Red Deer area was covered by Minnie Cunningham, Helen Harris (compiler), Dorothy Hazlett, Beth Peck, and Kerry and Marjorie Wood. They reported a total of 47 (41) species in flower. A noteworthy record from this count was that of *Hyoscyamus niger* (Black Henbane). This is an uncommon weedy species in the Nightshade family; the only other record for the May Count came from Calgary in 1985.

9. Buffalo Lake: The number of species recorded in flower from the Bird farm and Buffalo Lake Narrows area improved from the past two year's counts to 38 (31). Charley and Ann Bird, Max Capen, and Bess Paterson were the observers.

10. Ranfurly: Phyllis Kendrick and her family (four observers) submitted a list of 15 species in flower from their farm south of Ranfurly (along Highway 16 about halfway between Edmonton and Lloydminster).

11. Edmonton: Participation in the Edmonton area count continues to be good. Fourteen submissions were received this year, compared to 12 last year; seven came from within the city limits and seven came from outside the city, but within an 80 km radius. A total of 20 participants reported 152 (142) species in flower.

Within Edmonton two counts were done in the Whitemud-Blackmud creeks area in the southern part of the city. Derek Johnson and Elisabeth Beaubien found 54 (46) species in flower on May 24; George Scotter encountered 59 (69) species in the area on May 26. Beth Cornish visited Kinsmen Park and submitted a list of 16 species in flower. Patsy Cotterill was a very busy lady this year. In addition to her regular participation in the Wagner Natural Area count she found time to visit Little Mountain Urban Natural Area in the northern part of the city and a fen and forest community at the western edge of the city, finding 32 (22) species in flower in the former area and 26 species in the latter. Patsy also visited the University of Alberta campus and Terwillegar Park on May 27, recording 11 species in flower at the former and adding four species from the latter.

Outside the city Robert and Colin Stutzman surveyed an acreage 16 km south of Tofield recording 23 species in flower. At an acreage west of Tofield, Linda Kershaw and Judy Fairweather reported 33 (27) species in flower. Kevin Timoney and Anne Robinson surveyed an area on the Cooking Lake moraine listing 33 (30) species in flower. Elisabeth Beaubien and members of the George Pegg Botanic Garden Society visited the Pegg Garden, north of Glenevis, finding 36 species in flower. The Wagner Natural Area count yielded 62 (53) species in flower. Participants on this count included Patsy Cotterill, Alice Hendry, and Aileen Rhodes. The ever busy Patsy also managed to cover the Clifford E. Lee Nature Sanctuary encountering 31 (29) species in flower. The MacIsaac family, Dan, Linda, Colleen, Andrew, and Keith, along with Brian Free and Robert Vivian, visited the Chickacoo Lake Recreation Area, 10 km north of Stony Plain, on May 30, and found 28 species in flower.

Perhaps the most interesting record (supported by a specimen) from the Edmonton count was that of *Plantago elongata* (Linear-leaved Plantain). Edmonton is about 150 km north of the northernmost locality shown for this species in Moss (1983).

12. Entwistle: The thirteenth annual count around Hoople Lake resulted in a list of 67 (70) species in flower. Derek Johnson, Steve Zoltai, and Marty Siltanen were the observers. Finding willow species in flower was more difficult this year as beavers had eliminated a large patch of them last summer. For the first time in 13 years no flowering stalks of *Antennaria neglecta* (Broad-leaved Pussytoes) could be found. An early flowering record for the area was that of *Anemone canadensis* (Canada Anemone).

13. Hanmore Lake: Dave Ealey saw 25 species in flower in this area north of Smoky Lake. The most interesting record was that of *Arnica cordifolia* (Heart-leaved Arnica) as this area is east of the main distribution of the species in the province (Moss 1983).

14. Grande Prairie: There was some added interest in the count submitted from this area this year as it included a few records from Tanghe Creek, north of the Chinchaga River, about 16 km from the B.C.-Alberta border. Gavin and Ellen Craig sent in a list of 59 (51) species in flower, the majority from their farm northeast of Wembley. Jeanne Smith and Maxine Brown surveyed an area just north of Beaverlodge on May 23 finding 19 (19) species in flower. Jeanne and Ken Nash went to Spring Lake, south of Beaverlodge, on the count weekend and encountered 23 species in flower. The total for the Grande Prairie area was 67 (60) species in flower.

15. Fort McMurray: A good turnout of participants, and a spring which seemed to be relatively earlier than elsewhere in the province, resulted a high number of species being reported in flower. The 92 (64) species reported is the most for this area since 1980 and the third highest total ever for the area. Participants in this count included Dina Baisi, Bill Bloomsfield, Pat Connolly, Fred Corbut, Angela DeSilva, Marion Horrocks (compiler), Noreen Nadin, Phyllis Papineau, Helen Pachalko, Maria and Sarah Vyboh, and Jim Walbridge.

A complete listing of count results is available on request from the Curator of Botany, Provincial Museum of Alberta, 12845 - 102 Avenue, Edmonton, Alberta T5M 0M6. **The 1992 count will be held on the weekend of May 30-31.**

Hispid Paintbrush *(Castilleja hispida)*

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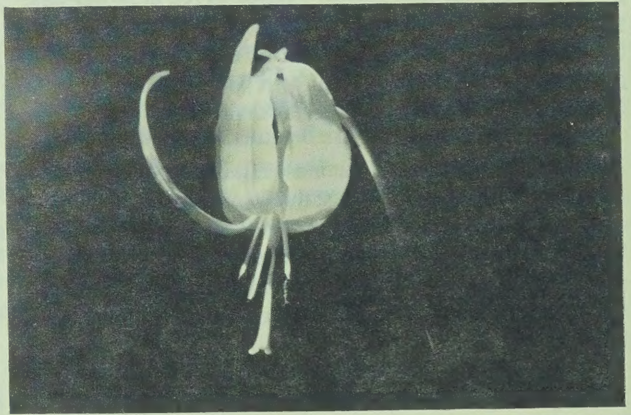

Glacier Lily *(Erythronium grandiflorum)*

Photos by J. Derek Johnson

Author's Address:
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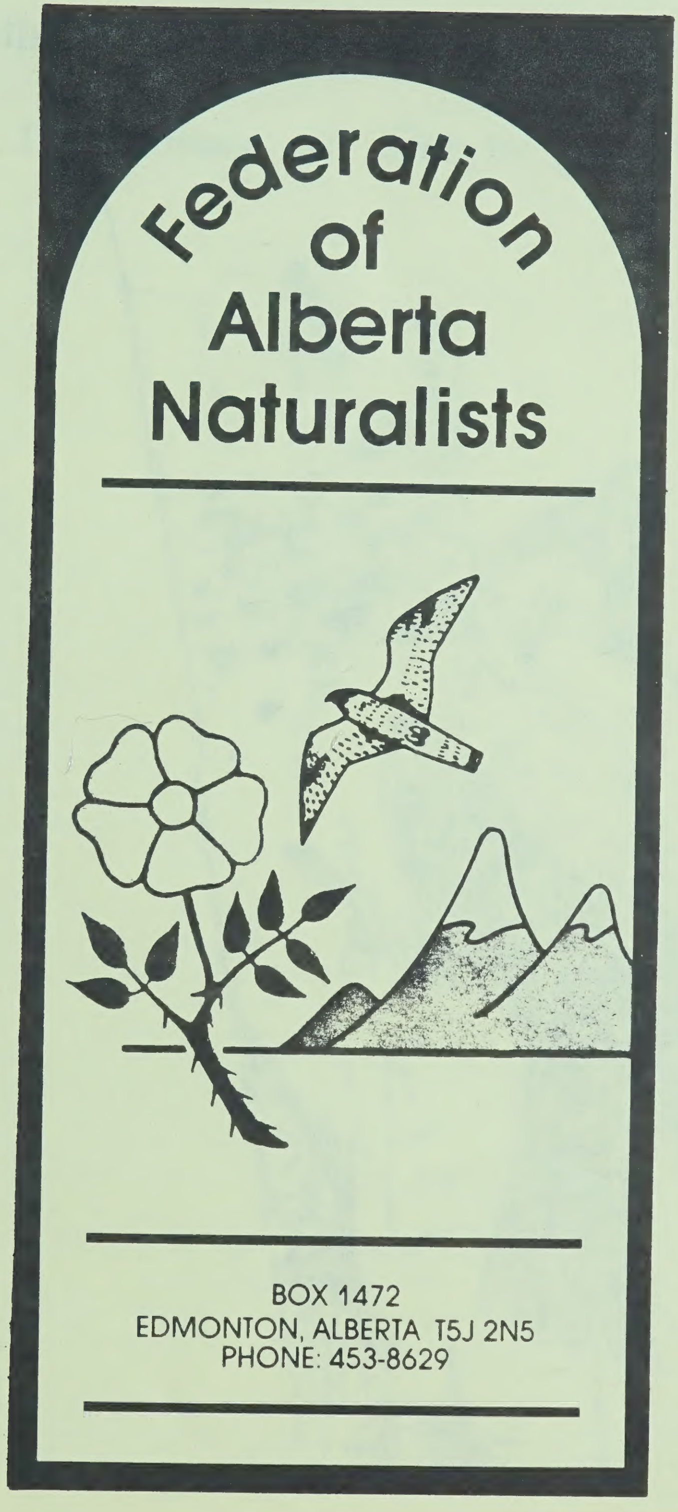

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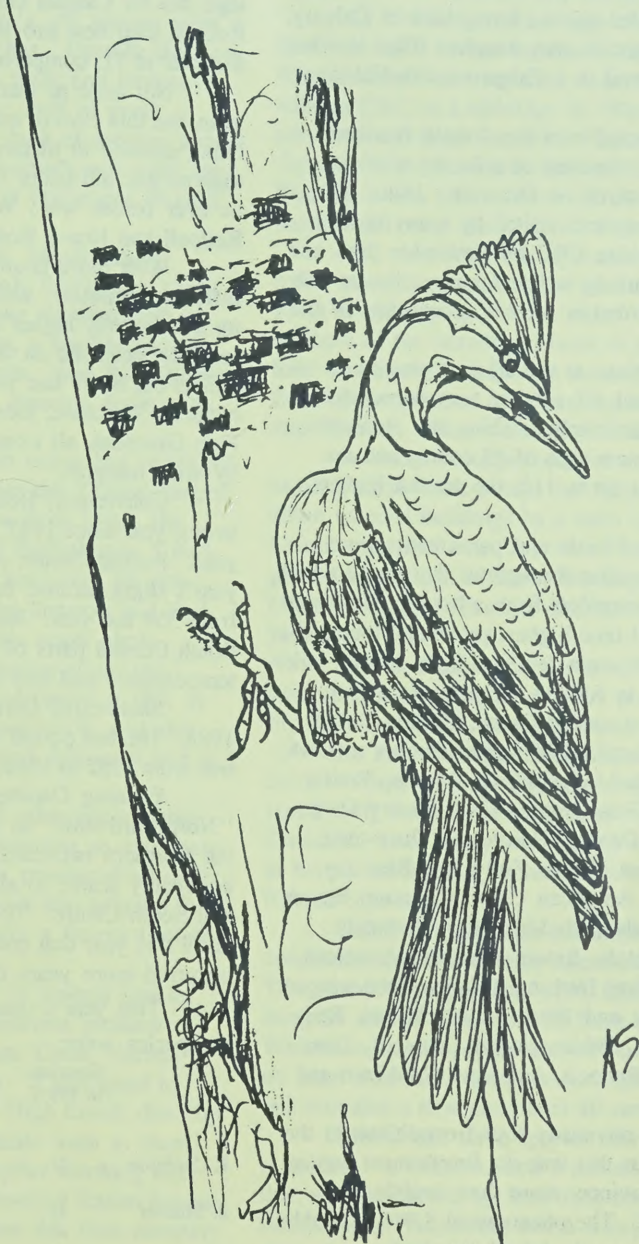
Alberta Christmas Bird Counts 1991

Recent Publications on Alberta Natural History



Alberta Christmas Bird Counts 1991

Andrew C. Slater

In August and September migrating Yellow-rumped Warblers in Southern Alberta outnumber all other warbler species put together. Late individuals usually linger to October and occasionally to November and even December. None have been recorded on a Christmas Bird Count in the province, however, although two other warbler species have, both in Calgary. A bit of a gap in the records was therefore filled in when a Yellow-rump was found in a Calgary residential area on the 1991 count.

Much less expected was the female Northern Cardinal that was first observed at a feeder at Moon River Estates near Monarch on December 14th. This individual was photographed, visited by many birders, included in the Lethbridge CBC on December 28th and was still appearing regularly in late January. It was only the third Cardinal recorded in Alberta at any time of the year.

These two additions to the all-time provincial CBC species list topped off another very successful effort. This hobby is definitely catching on! Reports were received from a new high of 53 counts and the number of species was up to 112, the second highest to date (after 1989).

High numbers of birds and participants were helped by the mild weather throughout the period which was remarked on by compilers from all over. No fewer than 41 species had all-time highest provincial totals. For those readers who get warm feelings from seeing which species are doing OK in Alberta, at least this winter, I will list them all: Red-necked Grebe, Canada Goose, Lesser Scaup, Bufflehead, Bald Eagle, Cooper's Hawk, Northern Goshawk, Red-tailed Hawk, Merlin, Prairie Falcon, Rock Dove, Great Horned Owl, Snowy Owl, Northern Hawk-owl, Downy, Hairy and Three-toed Woodpeckers, Northern Flicker, Gray Jay, Blue Jay, Black-billed Magpie, American Crow, Common Raven, Black-capped Chickadee, Red-breasted Nuthatch, White-breasted Nuthatch, Brown Creeper, American Robin, Northern Shrike, Dark-eyed Junco, Red-winged, Yellow-headed, Rusty and Brewer's Blackbirds, Rosy Finch, Pine Grosbeak, White-winged Crossbill, Common Redpoll, Hoary Redpoll, American Goldfinch and House Sparrow.

Canada Geese obviously found conditions in the South to their liking as this was the fourth most numerous species in the province, more than doubling its previous highest total. The phenomenal 8,846 at Lethbridge was easily a new provincial all-time high.

Northern Hawk-owls were widespread, 20 individuals occurring on eight counts. Last year there were 12 birds; the previous highest was only 5.

Widespread woodpeckers were Three-toed and Northern Flicker, seen on 15 and 11 counts respectively, compared to 6 counts last year for both. What Lethbridge did for Canada Geese, Edmonton did for American Robins, their new provincial all-time high of 47 boosting the total to 71, compared to a previous highest total of 39.

Not quite as many Gyrfalcons were found as last year, but this elusive and much sought-after visitor is still being counted in historically high numbers. Other winter visitors that did occur in numbers around twice as high as ever before were White-winged Crossbill, Common Redpoll and Hoary Redpoll.

With more counts being reported from more different localities, some ubiquitous species are showing up in relatively higher numbers. Great Horned Owls, for instance, occurred on 40 counts out of 53, compared to 28 counts out of 49 last year, while House Sparrow, Black-capped Chickadee, Downy and Hairy Woodpeckers and Pine Grosbeak all exceeded their previous highest totals by wide margins.

Conversely, Bohemian Waxwings had their lowest year since 1987, down to 11,968 from 36,807 last year. Ruffed Grouse numbers were up again after last year's slight decline, but Sharp-taileds were down to 129 from 354 last year. Rusty Blackbirds were plentiful in South Central parts of the province due to the warm temperatures and lots of open water.

Short-eared Owls are still declining from a peak in 1988. The last period with numbers as low as in 1991 was from 1982 to 1986.

Evening Grosbeaks appear to have undergone a "Northward shift" as they continue in good numbers in the Northern two-thirds of Alberta but have been noticeably scarce to absent for several years in the South and South Centre. The only species that failed to show at all this year that could be considered regular (having occurred more years than not) was Ring-necked Duck.

This year's counts achieving the largest increase in species were:

	Species in 199 1	Previous 5 - year Average	Percentage Improvement
1. Cardston	21	14.8	41.9
2. Stettler	23	16.6	38.6
3. Erskine	20	14.8	35.1

Cardston kept this championship in the South by enrolling one additional participant and finding one new bird, an American Dipper. Mallard, Crow and Raven were seen for only the second time on this count.

It is satisfying to see Stettler and Erskine, two neighbouring counts in Central Alberta with the same compiler, featuring on this list for a change. Mild weather after an early October blizzard kept some birds back, which helped, but a substantial increase in observer participation on both counts probably helped even more.

Highlights of Banff/Canmore's 49 species were a Western Grebe and 120 Rosy Finches. Happily the Bow Summit count resumed, with both birds and birders seeming to appreciate the lingering spell of good weather. They tied their previous high of species, almost doubled their previous high of individuals and were very relieved when a single White-tailed Ptarmigan showed up!

Bindloss had three Western Meadowlarks "staked out" all week, but could only find one on count day. The new count at Buffalo Lake reported both Cooper's and Sharp-shinned Hawks, a notable pair in Alberta in winter, but gave no details. (But then neither did any of the other counts which reported these rare and hard to separate raptors!)

Calgary's 69 species was one below last year's all-time high. Their next best bird, after the Yellow-rumped Warbler, was a Tundra Swan on the Bow River, the fourth ever on an Alberta CBC. 26 Buffleheads, 5 Red-tailed Hawks and 47 Northern Flickers were all new provincial all-time highs, while Song Sparrow and Red-winged Blackbirds were new for this count circle.

As well as for Robins, Edmonton re-set the provincial all-time high for Dark-eyed Juncos at 180. A Varied Thrush was new for this count circle, and also noteworthy were eight White-throated Sparrows and a Blue-winged Teal in count week.

Edson was forced by flu and other unavoidable circumstances to set a late date. They had an extremely good day nonetheless, setting a new provincial all-time high of eight Northern Hawk-owls and also tallying five Spruce Grouse, five Great Gray Owls, a Barred Owl and five Purple Finches.

Elk Island noticed increases in several species including Ruffed Grouse and it's common predator Northern Goshawk, Common Raven, Great Horned Owl, both crossbills and Pine Siskin. It was good to receive results from a new count at High Level, done by the Boreal Naturalist's Club, but details were in short supply, not even the name of a compiler reaching me.

Hinton considers itself the provicial Raven capital, having the highest count last year, but this time narrowly lost out to the Wildlife Reserve on this continually expanding corvid. They had a Townsend's Solitaire during count week.

Horseshoe Canyon submitted a long list of new and notable species, including Bald Eagle, six Golden Eagles, Mourning Dove, Northern Flicker, Brown Creeper, American Robin and Rusty Blackbird. Kimiwan/McLennan was another very welcome new count, which benefitted from and enjoyed the mild weather.

At Lethbridge, the Northern Cardinal was but the first item on a sensational list of rarities. Yellow-headed Blackbird has been reported only once before on an Alberta CBC, at Lethbridge in 1980, American Goldfinch only twice before, Peregrine Falcon and Common Grackle only three times before. Their 15 Red-winged Blackbirds was a new provincial all-time high. And in the background were those 8,846 Canada Geese......

The nine Wild Turkeys on the Medicine Hat count, it has been discovered, have been frequenting a ranch south of the city for several years. They are probably an offshoot of the introduced flock in the Cypress Hills. The lone Common Grackle was the only representative of a flock of ten that had been coming to a local feeder since mid-October. They were all present the previous day!

A Hairy Woodpecker was an unexpected addition to the Prairie Oasis count, carefully working over tumble-down wooden buildings by a farm cattle pen. 51 Canada Geese were also new, as was a Prairie Falcon that had a go at a large flock of Snow Buntings. Sharp-tailed Grouse were not found, a disappointment after 51 last year.

The new count at St. Albert/Big Lake had 99 participants thanks to a pre-count publicity drive. Probably their best birds were two American Coots.

St. Paul had several new species in their count circle: White-throated Sparrow at a feeder, Northern Hawk-owl, Ring-necked Pheasant and White-winged Crossbill. Like many others, they found Pine Grosbeaks to be increasing, but bucked the trend by declaring Ravens down.

Snake's Head's high participation and ideal mild conditions resulted in many spectacularly high counts. 24 Three-toed Woodpeckers, 1191 Black-capped Chickadees, 24 Brown Creepers, 21 Dark-eyed Juncos, 595 White-winged Crossbills and 64 Rusty Blackbirds were all more than twice the previous high for the count. The last was also a new provincial all-time high.

Tofield had three species new for their counts, all at feeders: a Red-breasted Nuthatch, a Harris' Sparrow that was confirmed by knowledgeable birders from Edmonton to Vermilion, and a Rusty Blackbird that was viewed at the compiler's home by all the visitors to the count wrap-up. Trapline rather surprisingly reported a White-tailed Ptarmigan, but without comment.

Wabamun Lake tallied over 50 species for the fifth year in a row. A description was submitted of the adult Glaucous Gull; good views were obtained at 30 metres when it alighted on the water. An immature of the same species was found dead on the causeway. This is the third provincial CBC record: Wabamun Lake had a Glaucous in 1977 and Calgary had two in 1981.

The two Red-necked Grebes were aslso a third year record on any Alberta CBC, while the 200 Lesser Scaup was a new provicial all-time high. Great Gray Owl was new for this count circle, but Black-backed Woodpecker was found for the sixth successive year, a record that all other counts must be envious of. Even Wabamun, though, has never had more than one in any year!

The Wildlife Reserve added White-throated Sparrow to its count circle list and, like other counts, reported highs of Black-capped Chickadees, Brown Creepers and Northern Shrikes. Writing-on-Stone, a new count described as "informal", found twelve American Goldfinches, only the third year in which this species has been found in the province, and 175 Rosy Finches, a new provincial all-time high. On 5th January, 18 Sharp-tailed Grouse were seen dancing on a traditional lek just outside the Provincial Park boundary, until they were scattered by a Goshawk.

In conclusion, I would like to thank gratefully those compilers, the great majority, who got their results to me on time. A few counts reached me more than three weeks after the published deadline of 31th January, and unfortunately had to be omitted.

* * * * * * * * * * *

Count Dates, Compilers and Participants

Banff/Canmore: Dec.14. Compiler: Mike McIvor, Box 114, Banff, AB T0L 0C0. Participants: Reg Bunyan, Heather Dempsey, Jack Edwards, Halle Flygare, Deb Hornsby, Tom Hurd, Doug Leighton, Myriam Leighton, Diane McIvor, Mike McIvor, Norbert Meier, Harold Mortimer, Ken Murphy, Weida Murphy, Brian Patton, Ian Pengelly, Vic Rogers, Keith Webb, Rupert Wedgwood, Cliff White, Gareth Thomson, Gerry Wilkie. (Bow Valley Naturalists).

Beaverlodge: Dec. 16. Compiler: Joan E. Kerr, Box 516, Beaverlodge, AB T0H 0C0. Participants: Jim Brown, Maxine Brown, Carol Cassity, Don Cliffe, Marie Cliffe, Thea Floyd, Joan Kerr, Bev McLauchlan, Andy Raniseth, Marilyn Raniseth, Jeanne Smith.

Bindloss: Dec. 14. Compiler: Michael D. O'Shea, General Delivery, Bindloss, AB T0J 0H0. Participants: Derek Barnes, Cresten Andersen.

Bow Summit: Dec. 28. Compiler: Mike McIvo, Box 114, Banff, AB T0L 0C0. Participants: Heather Dempsey, Peter Duck, Kevin Elliott, Horst Grothman, Deb Hornsby, Scott Lamont, Diane McIvor, Mike McIvor, Andy Miller, Carolyn Remmers, Gretchen Remmers, John Remmers, Pat Remmers, (Bow Valley Naturalists).

Breton: Dec. 29. Observer. Jeremy Stout.

Brule: Dec. 26. Compiler: Carly Deschuymer, Box 18, Brule, AB T0E 0C0. Participants: Julien Deschuymer, Leya Deschuymer, Emily Deschuymer, Morgan Deschuymer, Lisa and Roger Waidson, Peggy Shannon, Pearl Kennedy.

Buffalo Lake: Dec. 22. Compilers: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0. Observers: Roger Burmeister, Grant and Osborne Clark, Andy Murphy, Lloyd Lohr, Garnet Starke, Marlene Walentowitz. Feeder watchers: Doreen Anderson, Lex Bickle, Charles Bird, Marj Flewwelling, Nellie Kirr, Jack Ritchie, Phyllis Wood.

Calgary: Dec. 15. Compiler: Ian Halladay, 2103 Crocus Road, N.W., Calgary, AB T2L 0Z7.

Cardston: Dec. 26. Compiler: Shirley Sillito, Box 1102, Cardston, AB T0K 0K0. Participants: Connie Asseltine, Monty McClung, Rita Scotter, Jeff and Wendell Shaw.

Claresholm: Dec. 21. Compiler: Grace Norgard. Participants: Jason and Ruth Atwell, Hazel Hudson, Al Williams.

Dickson Dam: Dec. 29. Observers: Jim and Daniel Allen, John Henderson.

Drayton Valley: Dec. 25. Compiler: Helmut Amelang, P.O. Box 6791, Drayton Valley, AB T0E 0M0.

Eaglesham: Dec. 24. Compiler: Marc Granger, Box 147, Eaglesham, AB T0H 1H0. Participant: Diane Granger.

Eckville: Dec. 29. Observers: Hal and Linda Lutz.

Drayton Valley: Dec. 25. Compiler: Helmut Ameland, P.O. Box 6791, Drayton Valley, AB T0E 0M0.

Edmonton: Dec. 15. Compiler: Debbie Kronewitt Martin, 9319 - 177 Avenue, Edmonton, AB T5Z 1H7.

Edson: Jan. 5. Compiler: Paul Marshall, Box 7318, Edson, AB T7E 1V5. Participants: Kirby and Katherine Smith, John and Lawreen Ahlf, Larry and Connie Lind, Richard Quinlan, Alvin Grasse, Heather, Corinne, and Paul Marshall, Gloria Musson, Dorothy Bradford, Carol Crawford, Mavis, Ryan and Scott Holroyd, John and Elaine Bright, Margaret Hird, Chuck Lacy, Carl Schlick, Carl Hunt, Janet Edmond, Arnie Johansson, Myrna Field, Cheryl Bissell, Jack Adamson, Arthur and David Ahlf, Barb Armstrong.

Elk Island: Dec. 29. Compiler: Geoff Holroyd, 4123 - 122 Street, Edmonton, AB T6J 1Z1. Participants: Peter Achuff, Elisabeth Beaubien, Barb and Jim Beck, James and Sherry Benoit, Des and Mona Bovell, Wendy Calvert, Bob and Jan Carroll, Jim Christie, Vincent Cottrell, Lynne Dickson, Loney Dickson, Doug and Joanne Heckbert, Greg Henry, Brian Hornby, Johana Janelle, Jim Lange, Gerry Lunn, Wes Olson, Jack Park, Margo Pybus, Siew-Keen Quam, Mike Russell, Teresa Scholer, Carol Smith, Herb Tascoe, Helen Trefry, Paul Wadden, Ivan Whitson, (Edmonton Natural History Club, Friends of Elk Island Society).

Elk Point: Dec. 22. Compiler: Lynn Proskiw, Elk Point Community Services, General Delivery, Elk Point, AB T0A 1A0. Participants: Michelle Anton, Gerry and Terri Ehlert, Gunther and Jeanne May, Melvin McGinnis, Bill and Barbara Milholland, Sherry and Jordan Pelech, Wesley and Phyllis Scott, Fay Smith, Sheila Thompson, John Tilton and Billie-Lynn Milholland.

Erskine: Dec. 29. Compiler: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0. Observers: Allan and Bertha Clark, Angela, Brad and Josh Ford, Martha and Ron Kruger, Lloyd Lohr, Barb, Garnet and Glen Starke, Amanda, Kyle, Logan, Serena and Suilla Vaine. Feeder watchers: John Hadley, Samantha Kudras.

Fort Vermilion: Dec. 15. Compiler: Wendy Carpenter, Box 291, Fort Vermilion, AB T0H 1N0.

Grande Prairie: Dec. 21. Compiler: Andy Raniseth, 10028 - 87 Avenue, Grande Prairie, AB T8V 0B4. Participants: Margot Hervieux, Rick Scott, Doreen Cooke, M. Sheehan, Jeanne Smith, Ken Nash, Joan Kerr, Alf Richards, Gwen Richards, Glen Chilton, Lisa Chilton, Tony Graham, Norman Raniseth.

Gull Lake: Dec. 29. Observers: Jenny Abma, Mary Baker, Beatrice Burles, F. Fraser, Keith Freeman, Muriel Freeman, Lois and Gord Galbraith, Laurene Gillard, Roy Gillard, Ron Gray, Sandy Halberg, Herb and Muriel Harriman, Don Hughes, B. and C. Huisman, Jean and Charlie Huseby, Pearl Johnston, Pat and Kerry Knight-Davies, Richard Matthews, Ruth McPhee, Sharon Murphy, Gary and Terry Neilson, Ken Olson, Jessie and Percy Palmer, Barry and Wendy Raymond, Ted and family Sawyer, Alford and Florrie Skjonsberg, A. and J. Smellie, C.L. Stoness, Joan, Sam and Joanne Susut, Tom Turnbull, Darrel Unwin, Wilf and Catherine Wiese, June Wiese, Vivian Busat, Edith Hall, Luce Bernard.

Haynes: Dec. 29. Observers: John and Doreen MacDonald, Jim, Anna, Alyssa, Patrick Robertson, Lorna Smith.

High Level: Dec. 14.

Hinton: Dec. 14. Compiler: Beth MacCallum, 110 Seabolt Drive, Hinton, AB T7V 1K2. Participants: Dave Hobson, Dan Farr, Lori Hunt, Brad, Peggy and Naomi Armstrong, Jack Wright, Barry and Andrew Godsalve, Roberta Yakimchuk, Rick and Norma Bonar, Ann Bronson, Rocky Notnes, Laura Simmonds, Marg and Lloyd Stafford, Lorraine Kiel, Fran Hanington, Jacquie Hanington, Vern Truxler, Sean and Chris Currie, Karen Aldred, Max and Gwen Kudrenecky, Don Laishley, Mr. and Mrs. Stone, Bob and Mariette Lyons, Pam Hore, Rob Stewart.

Horseshoe Canyon: Dec. 14. Compiler: Robert W. Storms, #905, 815 - 14 Avenue, S.W., Calgary, AB T2R 0N5. Participants: Tom Bishop, Gary Clarke, Doug Collister, Ross Dickson, Roger Dunn, Mike Harrison, Al Kimberley, Bill McKitterick, Jamey Podlubny, Peter Sherrington, Wayne Smith, Don Schnider, Don Stiles, Robert Storms, Richard Thomas, John Thompson, Merril Wershler, Ray Wershler.

Kimiwan/McLennan: Compiler: Louise Faulkner, Kimiwan Lake and Wildlife Preservation Society, P.O. Box 606, McLennan, AB T0H 2L0. Participants: Randy Bowker, Rose Bowker, Barbara Christen, Eckhart Christen, Louise Faulkner, Ron Faulkner, Tamalyn

Faulkner, Pauline Gervais, Bill Howe, Charlotte Howe, Frank Lang, Mavis Lang, Francis Lessard, Marion Lessard, J.A. Limoges, Marriette Limoges, Alice MacMillan, Ted MacMillan, John O'Mahony, Phillipa O'Mahony, Pauline Perry, Bob Simpson, Anne Trotter, Wilfred Trotter, Anne Brassard.

Kneehill Valley: Dec. 29. Observer: Dorothy Dickson.

Lacombe: Dec. 29. Participants: Dave and family Bott, Clarence and family Haitsma, Lynette, Michael, Betty, Hart, Opal Key, Mike McNaughton, Alan and family Stolte, Marian, Paddy, Terry, T.J. Carlson.

Lethbridge: Dec. 28. Compiler: Graeme Greenlee, 2018 - 23 Avenue South, Lethbridge, AB T1K 1K6. Participants: Dale and Paul Baumback, Bruce and Lloyd Bennett, Anne and Bill Brown, Brigitte Byers, Linda Cerney, Doug and Teresa Dolman, Andrew and Witek Gierulski, Graeme and Pat Greenlee, Dick Gwatkin, Marilyn and Victor Hafichuk, Bob Hall, Helen Hampton, Alice Harper, Francis Hoye, Harold and Olga Hughes, Alice Luchansky, Berry and George Luco, Ted Lundstad, Don McDowell, Lois McKillop, Laure Neish, Sheila Petherbridge, Stan Piontek, Doris Rhodes, Alex, Frank and Katharine Russell, Liz Savoy, Caroline Schultz, Bill Sharp, Mark and Tamara Stabb, Jay VanderGaast, Doug Walker, Jessica, Joyce and Paul Wilkinson, Diana Williams, Gerry and Marion Wright.

Medicine Hat: Dec. 15. Compiler: Dennis Baresco, 130A - 3rd Street, N.E., Medicine Hat, AB T1A 5M1. Participants: Bill Brown, Linda Canham, Barb and Ron Chisholm, Kevin and Anne Corcoran, Eileen Cowtan, Dawn Dickinson, Bob Frew, Corlaine, Rob, Evan, Laurel Gardner, Florence Havill, Phil and Matthew Horch, Lex Karne, Luke Lindoe, Jim and Lorine Marshall, Peter and David Mehrer, Garry Newton, Mark and Kendra Oxamitny, Dorothy Robertson, Mark and Dan Schiebelbein, Ivan and Dana Shukster, Brent, Charlene, Shawn, and Jemma Skidmore, Bill and Ruth Tidy, Ben and Michael Velner.

Olds: Dec. 29. Observers: Catherine and Dave Bartlett, Don, Marg, John Findlay, Bill and Eleanor Reid.

Pine Lake: Dec. 29. Observers: Stewart & Eileen Ford, Herb and Helen Harris, Eileen Lawrence, Ron and Margaret Underwood.

Ponoka: Dec. 16. Co-compiler: Murray Mackay and Carolyn MacAulay, Box 1479, Ponoka, AB T0C 2H0. Participants: Mr. Bob Bartholow, Lois and Earl Berdine, Mr. Hal Brulhart, Mr. and Mrs. Jack Burns, Barbara and Keith Floyd, Don and Elaine Gill, Mr. and Mrs. Don Graham, Elmer and Joyce Hageman, Larry Lentz, Mary Leighton, Katherine Love, Mildred Lyons, Carolyn MacAuley, Murray and Margaret Mackay, Peter Monahan, Mr. Rowland, Irene Taylor, Tony Vandenberg and family, Art and Phyllis Walcheske.

Prairie Oasis: Dec. 26. Compiler: Joan McDonald, 91 Range Way, N.W., Calgary, AB T3G 1H6. Participants: Ross Dickson, Joan McDonald, Malcolm McDonald, Richard Thomas.

Raven: Dec. 29. Participants: Phillip and Colleen Anderson, K.D. Brown, Rod Burns, Bunny Dixon, Jim Dixon, Robert Hall, Maria Hall, Staff MRWEC, Doreen and William Thomsen, Rod Walker, Krystal Thompson.

Red Deer: Dec. 29. Compiler: Tom Pierce, Red Deer River Naturalists, P.O. Box 785, Red Deer, AB T5N 5H2. Participants: Ray Allen, Peggy Anderson, Freda and Ray Bertram, Ron and Roy Bjorge, Jim Caddy, Bev, John, Artica Campbell, Minnie Cunningham, Ursula and George Fedak, Flo and family Frank, John Grutter, Myron Gulka, Jean Guye, Sylvia Hayhoe, Dorothy Hazlett, Phyllis Knox, Pauline and Mark Hoskin, Clark and Annette Johnson, Jr. Fr. Wardens, Donna Kafara, Keith Kline, Curtiss Lund, Bud and Eileen Lund, John Malanic, Jean and Jim McCormick, Betty and Sandra McGhee, Joyce More-Kilganon, Sandy and Dorothy Murray, Ione Napper, Lilian Newnham, Michael and Jennifer O'Brien, Maxine O'Riordan, Oscar and Sara Orr, Linda Parrington, Myrna Pearman, Tom Pierce, Marie Pierce, Dr. V.J. Ratzlaff, Jim and Patrick Robertson, Walter and Nellie Savage, Marylou Sinio, Keith and Beryl Steele, Tom Stevens, Al and Mary Taylor, Rod Trentham, Irene and Paul Watson, Eric Wilford, Kevin and Thea Wingert, Kerry and Marjorie Wood, Jan Pahl, Fred Schutz, Irene Watson, Trudy Carson, Harvey and Matthew Smith, A. Sophia Kooman, Aaron Collins.

Rimbey: Dec. 29. Observers: Ed Brown, Mary Burrows, Earl and Mary Eadie, Frank and Olga Lind, John More, Fred Schutz, Kate Thorne.

St. Albert: Dec. 29. Compiler: Bob Lane, Big Lake Environment Support Society. Participants: Julie Tweeten, Scott Bricker, Harvey Kuszmaniuk, P. Stubbs, Lenore Stoneberg, Muriel Toop, Ann Conlin, Sharon Ranson, Bob Lane, Fin Fairfield, Glen Semenchuk, Alice Hendry, L. Bogaert, Gary Smith, Albert Doberstein, Bruce Thompson, Doreen Row, Chris Menard, Alice Goulet, Don Gerylo, Susan Sharkey, Dave Nadeau, Terry Thormin, Peter Whitehead, Hans Flatla, Dave Organ, Ted Marshall, Rodger Edwards, Emil Verstraete, Peter Demulder, Wilma Turkington, Doug Culbert, Peggy Mair, Rodger Belley, M. Gauthier, Barry Jenkins, Ruth Horne, Sandra De St. Croix, Mary Anderson, Dwayne Jenkins, Jim McGraw, Allan Daimer, Allan Hingston, Sharon Dyer, Jasper Keizer, Elsie Weller.

Snake's Head: Dec. 28. Compiler: Doug Collister, 3426 Lane Cr. S.W., Calgary, AB T3E 5X2. Participants: Judy Archer, Tom Bishop, Art Campbell, Doug Collister, Eileen Dann, Ross Dickson, Olga Droppo, Jean Dunn, Rodger Dunn, Ingrid Ektvedt, Maggie Ellen, Shirley Fraser, Don Greenfield, Diane Haselmayer, Ferrell Haug, Allan Kimberley, Randolph Lauff, Karen McCullough, Joan McDonald, Malcolm McDonald, John McFaul, Lynn Moore, May Parker, Miles Scott-Brown, Peter Sherrington, Wayne Smith, Don Stiles, Bob Storms, Richard Thomas, John Thompson, Howard Troughton, Margaret Vasington, Merrill Wershler, Ray Wershler, Bill Wilson.

Stettler: Dec. 15. Compiler: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0. Observers: John Becklund, Roger Burmeister, Jim Burrell, Allan and Bertha Clarke, Francis Dodds, Trudie Grafe, Bernice and Lloyd Greenlee, Elmer Gross, Gladys and Wilf Hewlett, Ron Kruger, Bea and Marvin Lohr, Lloyd Lohr, George and Grace Neill, Barbara Smith, Marlene Walentowitz, John and Noreen Ward. Feeder watchers: Chuck Blakely, Alice Bitzer, Dorothy Brownlee, Chris Byers, Hugh and Nora Charles, Peter Cooper, Annie Dannewald, Blair and Stewart Fix, Ernst Grafe, Art Johnson, Lawrence Kennedy, Eva Kirtley, Rolf Lehman, Geoff Morrish, Bertha Smith.

Switzer Park: Jan. 1. Co-compiler: Laurie Emily Hunt and Dan R. Farr, Box 5011, Hinton, AB T7V 1X3. Participants: Elisabeth Beaubien, Dan Farr, Geoff Holroyd, Michael Holroyd, Peggy Holroyd, Laurie Hunt, Carol Hunt, Gillian Hunt.

Sylvan Lake: Dec. 29. Observers: D. Ammeter, Marg Halkett, Germaine Maga, Kate More, Myrna Pearman, Albert and Beth Peck, Heather Sjare, Emily Stinn, Nora Ready.

Tofield: Dec. 29. Compiler: Roy Fairweather, R.R. #2, Tofield, AB T0B 4J0. Participants: Ross Brain, Roy Berg, Jessie Fairweather, Pete Kershaw, John McShane, Donna McShane, Kerri Arnott, Hugh Campbell, Tracy Goodman, Pat Nolan, Rob Schneider, Orrin Stephen.

Trapline: Dec. 15. Compiler: Ellen Craig, R.R. #1, Wembley, AB T0H 3S0. Participants: Gavin and Ellen Craig.

Vermilion: Dec. 21. Compiler: Iris Davies, Box 93, Dewberry, AB T0B 1G0. Participants: Dennis and Aubrey Berdine, Tom Brown, Alex Burnett, Ralph and Iris Davies, Doreen and Myron Dietz, Stan and Ruth Geake, Stu and Anne Heard, Rod Peters, Sheila Purves, Dave and Nancy Twynam and Fay Yaceyko.

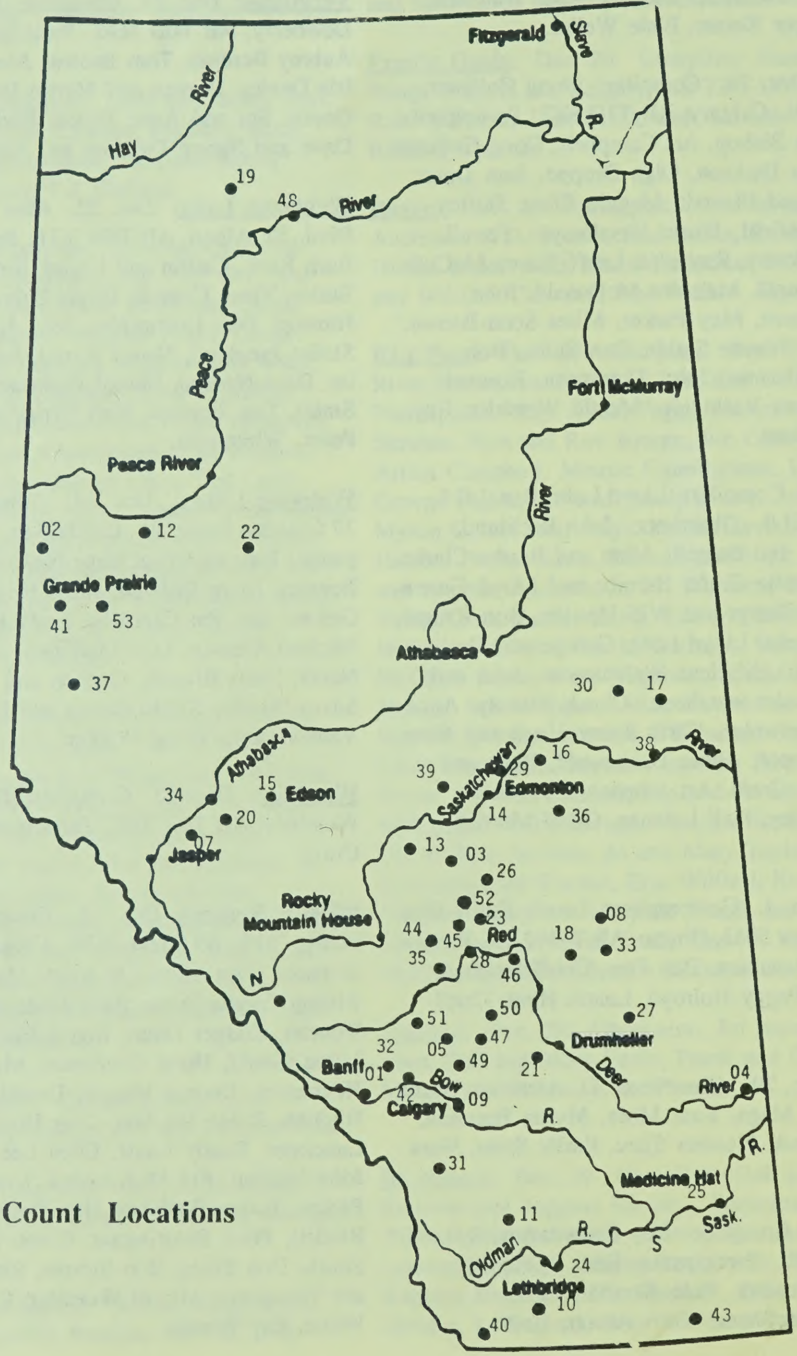
Wabamun Lake: Dec. 22. Alan Hingston, 53 Wakefield Blvd., St. Albert, AB T8N 3G1. Participants: Jim and Barb Beck, Caitlin and Lesley Brown, Jamie Bruha, Jim Butler, Vince Cottrell, David Ealey, Jim Faragini, Alan Hinston, Wes Hochachka, John Hurst, Joanne Hyland, Stefan Jungkind, Nancy Kariel, Jim Lange, Pat Marklevitz, Dave Nadeau, Harold Pankratz, Alf Scott, Judith Smith, Tim Spanton, Kari Vepsalainen, Fred Whiley, Peter Whitehead.

Waterton Lakes: Dec. 14. Compiler: Teresa Dolman, 37 Carleton Road, W., Lethbridge, AB T1K 3X4. Participants: Dale and Paul Baumback, Lloyd and Bruce Bennett, Doug Dolman, Heidi Eijgel, Witold Gierulski, Graeme and Pat Greenlee, Betty Haig, Terry Hammell, Michael Klassen, Lois McKillop, Julia Millen, Laure Neish, Doris Rhodes, Gordon and Hazel Ross, Liz Savoy, Shirley Sillito, Janice and Fraser Smith, Jay VanderGaast, Doug Walker.

Wembley: Dec. 22. Compiler: Ellen Craig, R.R. #1, Wembley, AB T0H 3S0. Participants: Gavin and Ellen Craig.

Wildlife Reserve: Dec. 21. Compiler: Jamey Podlubny, 3516 - 60 Street, N.W., Calgary, AB T3B 5E8. Participants: Des Allen, Liz Allen, Mairi Babey, Tom Bishop, Eileen Dann, Ross Dickson, Olga Droppo, Joel Duncan, Rodger Dunn, Ingrid Ektvedt, Shirley Fraser, Lorne Gould, Horst Grothman, Michael Harrison, Frank Hennessey, Doreen Higgin, Dorothy Hill, Cedric Hitchon, Robin Hitchon, Clay Hunt, Jill Lancaster, Peter Lancaster, Randy Lauff, Ellen Lee, Karen McCullough, John McFaul, Bill McKitterick, Lynn Moore, May Parker, Jamey Podlubny, Jim Posey, Mike Preston, John Riddell, Peter Sherrington, Gwen Simpson, Wayne Smith, Don Stiles, Bob Storms, Richard Thomas, Howard Troughton, Merrill Wershler, Ray Wershler, Jim White, Ray Woods.

Writing-on-Stone: Jan. 5. Compiler: Michael Klassen, 9102 - 94 Avenue, Fort Saskatchewan, AB T8L 1B7. Participants: John Acorn, Sid Andrews, Heidi Eijgel, Michael Klassen, Sandra Leckie, Scott Mair, Liz Savoy, Jay VanderGaast, John Walper.


Fitzgerald
Slave
R.
Hay
River
19
48
River
Peace
Fort McMurray
Peace River
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02
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22
Grande Prairie
41
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Athabasca
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Athabasca
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River
39
Saskatchewan
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Edmonton
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Edson
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Jasper
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Rocky Mountain House
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Red
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Drumheller
32
05
49
21
Deer
Banff
01
42
Bow
04
River
09
Calgary
R.
R.
31
Medicine Hat
25
11
Sask.
R.
S
Oldman
24
Lethbridge
10
43
40

Count Locations

Christmas Count Coverage and Weather Conditions

MAP NO.	COUNT NAME	KMS BY VEHICLE	KMS ON FOOT/SKIS	HOURS VEHICLE	HOURS ON FOOT/SKIS	WATCH HRS. FEEDERS/ OWLING	MAX TEMP DEG CELC	MIN TEMP DEG CELC	MAX WINDSP. KMH	MIN WINDSP. KMH	MAX DEPTH SNOW CMS	MIN DEPTH SNOW CMS
1.	Banff/Canmore	195	123	8.5	64	41	-3	-9	25	8	20	10
2.	Beaverlodge	274	6	18.5	2.5	7.5	2	-17	5	0	41	25
3.	Bentley	0	0	0	0	3.5						
4.	Bindloss	35	4				-5	-8			2	1
5.	Dickson Dam	90	14.5	2	7.5	0.5						
6.	Bow Summit	95	53	6.5	31	0	-3	-9	8	0	85	75
7.	Brule	10	10	0.5	2.5	6	10	5	40	0	10	0
8.	Buffalo Lake	86	16	6.75	6	15	-4	-8	5	0	30	8
9.	Calgary	720	230	45	175	355	9	5	61	7	10	0
10.	Cardston	175	4	12	3	2	10	-2	5	0	0	0
11.	Claresholm	437	11	18	4.5	2	10	4	30	0	0	0
12.	Eaglesham	0	3	0	2	5	0	-5	5	0	45	15
13.	Drayton Valley	220	4	5	2	2	0	-5	3	2	20	0
14.	Edmonton	1382	573	82	307	1214	6	-2	16	6	31	11
15.	Edson											
16.	Elk Island	628	151	32	70	9	-5	-15	5	0	45	20
17.	Elk Point	82	3	7.5	2	33	2	-4	15	9	100	5
18.	Erskine	323	13.5	10	5.5	6	0	-11	5	0	30	6
19.	High Level											
20.	Hinton	415	27.5	17	16.5	32.5	1	-2	20	0	20	6
21.	Horseshoe Canyon	684	111	18.5	53.5	0	1	-15	32	0	8	0
22.	Kimiwan/McLennan						6	1	5	0		
23.	Lacombe	22	12	2	4.25	13.5						
24.	Lethbridge	474	97	23	57	14	8	-10	19	0	0	0
25.	Medicine Hat	385	79	19.25	46.5	9.5	8	-5	35	5	1	0
26.	Ponoka	250	4	10	2	90	0	-10	10	0	16	4
27.	Prairie Oasis	219	5	8.75	3.25	0	-3	-8	30	10	10	0
28.	Red Deer	128	137	9.75	68.75	117.5						
29.	St. Albert						-8	-12	5	0		
30.	St. Paul	354	9	29	4	2	-5	-10	5	0	30	15
31.	Sheep River	572	56	28	32	6	6	-2	80	5	15	0
32.	Snake's Head	1035	155	45	84.75	14.3	7	-2	8	0	25	0
33.	Stettler	336	14	19	6.5	45	5	-5	5	0	10	5
34.	Switzer Park	87	40	2.5	12.5	6	4	-4	15	5	30	10
35.	Sylvan Lake	26	6	3	3	35.5						
36.	Tofield	622	10	28	3	12	-9	-13	8	0	30	0
37.	Trapline	98	30	3	4	0	5	-6	40	10	50	40
38.	Vermilion	196	18	32	5.5	13.5	3	-5	20	0	40	15
39.	Wabamun Lake	741	68.5	38.5	47.5	22.25	0	-9	12	8	30	10
40.	Waterton Lakes	97	41	15	27	2	-1	-12	60	40	60	0
41.	Wembley	211	3	7	1	1	5	-1	5	0	30	20
42.	Wildlife Reserve	1014	190	45	95	5	8	4	120	16	41	5
43.	Writing-on-Stone	40	29									
44.	Eckville	0	0	0	0	5.5						
45.	Gull Lake	199	28.5	10.5	1.75	102.75						
46.	Haynes	45	5.5	1.25	8.25	0						
47.	Kneehill Valley	30	3	1	3	4						
48.	Fort Vermilion	23	2	4	2	1						
49.	Olds	90	6	5	3.5	6						
50.	Pine Lake	46	0	2	0	16						
51.	Raven	95	27	4.5	12.25	22.5						
52.	Rimbey	0	2.5	0	1	29						
53.	Grande Prairie	359	45	21.5	18.5	6.75	7	-2	93	19	35	0

Alberta Christmas Bird Counts 1991

LOCALITY SPECIES	BANFF/ CANMORE	BEAVER-LODGE	BRETON	BIND-LOSS	DICKSON DAM	BOW SUMMIT	BRULE	BUFFALO LAKE	CALGARY	CARD-STON	CLARES-HOLM	EAGLE-SHAM	DRAYTON VALLEY
Canada Goose									1910				
Mallard	1238				228				10126	100	5		2
Lesser Scaup					50				14				
Common Goldeneye	187				28	3			301				80
Common Merganser	5								66				
Bald Eagle	5				3				10	2			1
N. Goshawk									6		1		1
Rough-legged Hawk									3				
Golden Eagle				1						4	1		
Merlin				1					16		5		
Prairie Falcon									3		4		
Gray Partridge		7							118	5	13		
Ring-necked Pheasant		2		2				1	22	1	1		
Spruce Grouse													
Ruffed Grouse	1	1						2	7			2	4
Sharp-tailed Grouse				11					4	9			
Rock Dove		118		9	27			47	1956	46	188	4	
Great Horned Owl		1		2	2			2	26	1	3		
Snowy Owl		1			1						1	1	
Great Gray Owl													
Downy Woodpecker	18	8	3	1			4	35	56	7	10		3
Hairy Woodpecker	12	11					2	22	9	1	2	2	2
Three-T. Woodpecker	2					1			2				
N. Flicker	1								47	3			
Pileated Woodpecker									1				
Horned Lark				1					2	4	11		
Gray Jay	33	3				4	11						6
Blue Jay	3	47	12		2			29	148		5	4	6
Bl.-billed Magpie	167	83		103	18			35	2009	62	115	18	9
American Crow	13								38	4			
C. Raven	144	48	6			10	5		96	2	18		24
Bl.-capped Chickadee	235	137	58		20	12	33	193	944	15	25	40	29
Boreal Chickadee	60				8	24			23				
Red-br. Nuthatch	47		15			24		3	51		4		1
While-br. Nuthatch	14	6					4		64		4		1
Brown Creeper	11								9				
American Dipper	35					1			3	2			
Golden -cr. Kinglet	1					2			3				
American Robin	2								14				
Bohemian Waxwing	171								5229	55	32		
Northern Shrike	3	2							6		1		1
European Starling	13	61		1					894	4	60		
Am. Tree Sparrow	1			8					1				
White-th. Sparrow									2		1		1
Dark-eyed Junco	26								47				
Snow Bunting		49		100					1		11		250
Rusty Blackbird	12								1				
Pine Grosbeak	120	64				36	7	9	218				16
Purple Finch								3					
Wh.-winged Crossbill	262					101			164				
C. Redpoll	68	54		126		37		60	1192	135	227		12
Hoary Redpoll		1							1				
Pine Siskin	11					2			10			5	
Evening Grosbeak	87												
House Sparrow	69	312		101			28	141	3159	316	552		
Total Species	49	22	5	15	13	16	8	16	69	21	25	9	19
Total Individuals	3356	1018	94	469	598	285	94	584	28534	778	1299	77	449
Total Observers	22	11	1	3	3	13	9	14	141	6	5	2	1

Alberta Christmas Bird Counts 1991

LOCALITY SPECIES	FORT VERMILION	EDMONTON	EDSON	ELK ISLAND	ELK POINT	ERSKINE	HIGH LEVEL	HINTON	HORESHOE CANYON	KIMIWAN/ McLENNAN	LACOMBE	LETHBRIDGE	MEDICINE HAT	PONOKA
Canada Goose												8846	3089	
Mallard		4072										1942	126	1
Lesser Scaup												6		
Common Goldeneye		152										263	69	
Common Merganser												6	12	
Bald Eagle		2							1			12	6	
N. Goshawk		4	1	7				2	6	1				
Rough-legged Hawk		3							1					
Golden Eagle									6			2	4	
Merlin		26									1	3		
Prairie Falcon									1			5	4	
Gray Partridge	1	151		8		17			14			14	40	3
Ring-necked Pheasant		41		2					36			25	17	
Spruce Grouse			5					2						1
Ruffed Grouse		10	19	17		5	1	2		6	1			55
Sharp-tailed Grouse	1	1	4	6	1				9	1				
Rock Dove		2983	57	148		45		3	276	100	2	426	1715	174
Great Horned Owl		30	2	9	2	3			9	1	1	12	9	5
Snowy Owl		1		1	1				1	3	1	2		4
N. Hawk Owl		3	8											
Great Gray Owl	1		5					1		1				1
Downy Woodpecker	1	278	24	66	9	5		7	27	39	10	37	17	26
Hairy Woodpecker	1	130	28	63	5	2	2	3	11	29	5	6		18
Three-toed Woodpecker			1	1				5					2	
N. Flicker		22							1			16	8	
Pileated Woodpecker		15	3	5		1			3					2
Horned Lark									2			9	2	
Gray Jay	6	5	111	5	7		10	50		9				2
Blue Jay	3	1465	84	141	23	9		17	26	228	32	33	9	42
Bl.-billed Magpie	3	2822	54	264	22	49	10	44	377	46	32	415	560	139
American Crow		21		3						11		15		
C. Raven	11	19	201	53	22	4	227	343	2	53	4	3		17
Bl.-capped Chickadee	3	4826	472	685	133	128	8	206	336	211	115	124	75	180
Boreal Chickadee		35	37	36			1	14			30			5
Red-br. Nuthatch		286	1	7	4			4	96		4	17	29	2
White-br. Nuthatch		263	34	32	13	3		4	3	3	10	10	2	18
Brown Creeper		16	1	6					1				2	
American Dipper								1						
Golden-cr, Kinglet		13						1	49			5	4	
American Robin		42							2			3	2	
Bohemian Waxwing		1419	12	5	1			30	775	4		55	153	
Northern Shrike		4		8			1		1				5	2
European Starling		564	15	3					3	4	31	164	65	4
Am. Tree Sparrow									5			22	4	
Wh.-throated Sparrow		8									1			
Dark-eyed Junco		180	1	13					1			22	73	
Snow Bunting		128	101	120	20	32	180	2	683				4	180
Rusty Blackbird									1			2		
Pine Grosbeak	63	796	94	146	106	3	78	136	147	146	46	15	14	94
Purple Finch		1	5		6						9			
Wh.-winged Crossbill		1374	2	158			1		547			25		27
C. Redpoll	25	757		395		36	180	18	786	41	77	194	87	232
Hoary Redpoll	20	20		45	1				23					
Pine Siskin		105	2	11	7	25					8			24
Evening Grosbeak	15	212	14	161	56	18	47	18	2	61	59			178
House Sparrow	30	8032	110	182	205	307	72	206	425	21	91	1029	1858	553
Total Species	16	55	33	37	20	20	14	25	41	22	22	49	35	28
Total Individuals	185	31452	1718	2835	644	688	818	1122	4717	1019	570	13861	8089	1990

Alberta Christmas Bird Counts 1991

LOCALITY	GRANDE PRAIRIE	PRAIRIE OASIS	RED DEER	ST. ALBERT	ST. PAUL	SHEEP RIVER	SNAKES HEAD	STET-TLER	SWITZER PARK	SYLVAN LAKE	TOFIELD	TRAP-LINE	VERMI-LION	WABAMUN LAKE
SPECIES														
Canada Goose		51												5
Mallard	1	230	124	13	2		31							208
Lesser Scaup				3										200
Common Goldeneye	10	77												475
Common Merganser		5												6
Bald Eagle			2				4							3
N. Goshawk					2	1	3				1	4		2
Rough-legged Hawk			1			15				1		1		
Golden Eagle												1		
Merlin			1	5		1							1	1
Prairie Falcon		1												
Gray Partridge		16	5	18	25		13	39			28		49	
Ring-necked Pheasant	1		4	1	1						2		3	
Spruce Grouse	1											1		
Ruffed Grouse	9		7	6	11	6	17		4	10	5	4		12
Sharp-tailed Grouse				1	5			13			7			
Rock Dove	130	62	659	562	250	2	113				158		95	41
Great Horned Owl	1	1	5	5	3	5	1	1		2	2	1	2	20
Snowy Owl	1	2	1	13			1				4		1	
Great Gray Owl							2					1		1
Downy Woodpecker	3		59	62	6	16	29	22	1	13	19		15	53
Hairy Woodpecker	1	1	35	19	4	6	12	17	2	8	11	2	15	50
Three-toed Woodpecked			1			7	24		2			1		2
Northern Flicker				2										
Pileated Woodpecker			8	5		3	8			1	2	2		9
Horned Lark														
Gray Jay	10			2	1	61	76		27	1		7		44
Blue Jay	22		166	131	15	7	90	68		19	52		72	183
Bl.-billed Magpie	92	56	387	557	120	64	216	148	2	18	174	3	101	183
Bl.-capped Chickadee				3			1							4
C. Raven	124		25	3	6	144	279	12	18	10	8	55		84
Bl.capped Chickadee	153		813	633	181	482	1191	223	40	124	231	7	106	855
Boreal Chickadee	1		66	15	2	88	228			8		1		71
Red-br. Nuthatch			21	22		55	146	10			1		5	23
White-br. Nuthatch	4		38	23	3	6		5	4	13	10			24
Brown Creeper			1	1		5	24		1					3
American Dipper						1	1		1					
Golden Cr. Kinglet				2		2	20							1
American Robin	3		1	2				1						
Bohemian Waxwing	26		2602	245	550			97		12	28		146	
Northern Shrike	2		4		1	5	3	1			1	2		4
European Starling	11	1	293	10	24		1	25			16		11	10
Am. Tree Sparrow				2										
White-th. Sparrow			2		1									
Dark-eyed Junco			19	18	6	4	21	11						
Snow Bunting	39	700		48	370	20	325	221				200	60	
Rusty Blackbird						18	64				1			
Pine Grosbeak	29		107	246	79	57	55	38		10	40		84	96
Purple Finch			2											
Wh.-winged Crossbill			5	386	20	341	595					5	48	194
C. Redpoll	30	31	298	109	118	491	781	127		71	102	50	149	92
Hoary Redpoll	2		19	4	3		1	9		15	10			4
Pine Siskin			2	3	1		1		2					6
Evening Grosbeak			114	121	9	77	32			3	72			136
House Sparrow	129	62	714	724	511	185	138	326		46	483		283	137
Total Species	25	17	37	40	31	32	39	23	12	20	27	22	19	51
Total Individuals	825	1235	6688	4028	2331	2196	4574	1416	104	384	1469	352	1246	3381
Total Observers	14	4	93	99	22	23	42	40	12	10	13	2	17	26

Alberta Christmas Bird Counts 1991

LOCALITY SPECIES	WATER. LAKES	WEMBLEY	WILD. RES.	WRITING ON-STONE	ECK-VILLE	GULL LAKE	HAYNES	KNEEHILL VALLEY	OLDS	PINE LAKE	RAVEN	RIMBEY	TOTAL
Canada Goose	100												14002
Mallard	14		8			152							18623
Lesser Scaup	4												277
Common Goldeneye	24												1669
Common Merganser													100
Bald Eagle	1			1		3							56
Northern Goshawk		2	6	1		3		1				1	56
Rough-legged Hawk		2	12						2				45
Golden Eagle	1		1	3									24
Merlin													60
Prairie Falcon													18
Gray Partridge		7				35			10			11	646
Ring-necked Pheasant				13	3						5		195
Spruce Grouse											2		12
Ruffed Grouse		15	21			28	2				2	7	298
Sharp-tailed Grouse		20	4	30		1						38	129
Rock Dove		75	49	74		362	16		54		8		11032
Great Horned Owl		3	4	1		7	3	1	1		1	1	189
Snowy Owl		1				6			1	1			52
N. Hawk Owl		2	1										20
Great Gray Owl			2										16
Downy Woodpecker	5	5	47	4	2	46	6	2	2	6	14	20	1158
Hairy Woodpecker	5	4	18		2	34	6		2	3	8	17	649
Three-toed Woodpecker			5			1					2		57
N. Flicker				3		3			1				107
Pileated Woodpecker						3						1	72
Horned Lark		8											39
Gray Jay	13		125			1					14	13	657
Blue Jay		16	31		4	104	13	2	19	4	23	41	3450
Bl.-billed Magpie	17	35	185	48	6	152	16	14	56	19	39	15	10155
American Crow			17			3			1				134
C. Raven	38	300	356		2	66	6	1	3	4	32	14	2904
Bl.-capped Chickadee	49	40	1347	6	8	665	55	17	24	42	162	138	16836
Boreal Chickadee	3		191			10					27	11	994
Red-br. Nuthatch	44		81		1	1	2				3		1030
White-br. Nuthatch	3		24			24	2	1	2	2	22	7	704
Brown Creeper	1		19			1							102
American Dipper	3		5										53
Golden-cr. Kinglet			11										115
American Robin													71
Bohemian Waxwing				50		225	20					25	11968
Northern Shrike	1		16	1					1		2		78
European Starling		45		2		32	6		14				2386
Am. Tree Sparrow			15	4									62
White-throated Sparrow		1	1										17
Dark-eyed Junco	3		1	6		2					4		458
Snow Bunting	75	225	132	1		400	11	30					4718
Rusty Blackbird			2										101
Pine Grosbeak	58	21	72	13	6	85	20			16	40	88	3614
Purple Finch													26
Wh.-winged Crossbill	16		655				4	15					4976
C. Redpoll	175	450	1194		25	941	32		49	28	74	252	10388
Hoary Redpoll		3	2			49	2			2			236
Pine Siskin	10		2			10	18						260
Evening Grosbeak	8	5	31		21	111	37			14	24	268	2010
House Sparrow		40	187			684	59	16	115	4	31	70	22743
Total Species	29	25	42	21	10	37	22	11	19	13	23	19	112
Total Individuals	749	1326	4910	658	73	4275	339	100	358	145	540	1001	152146

Species Recorded on Five or Fewer Counts

SPECIES	COUNTS AND NUMBER RECORDED
Pied-billed Grebe	Wabamun Lake 1
Horned Grebe	Waterton Lakes 1
Western Grebe	Banff/Canmore 1; Wabamun Lake 5
Red-necked Grebe	Wabamun Lake 2
Tundra Swan	Calgary 1
Wood Duck	Calgary 3
Green-winged Teal	Calgary 3
Northern Pintail	Banff/Canmore 1; Calgary 9; Lethbridge 1; Wabamun Lake 4
Gadwall	Calgary 5; Wabamun Lake 18
American Wigeon	Calgary 2; Wabamun Lake 64
Canvasback	Dickson Dam 10
Redhead	Calgary 8; Wabamun Lake 5
Barrow's Goldeneye	Banff/Canmore 5; Calgary 10; Edmonton 2
Goldeneye Sp.	Banff/Canmore 5
Bufflehead	Banff/Canmore 1; Calgary 26; Lethbridge 15; Medicine Hat 6; Wabamun Lake 2
Hooded Merganser	Calgary 2; Prairie Oasis 4; Wabamun Lake 21
Ruddy Duck	Wabamun Lake 2
Duck Sp.	Dickson Dam 200
Northern Harrier	Dickson Dam 1
Sharp-shinned Hawk	Buffalo Lake 1; Edmonton 1; Stettler 1
Cooper's Hawk	Buffalo Lake 1; Edmonton 2; Erskine 1
Accipiter	Wildlife Reserve 1
Red-tailed Hawk	Calgary 5; Gull Lake 1
Eagle Sp.	Bindloss 1
American Kestrel	Lethbridge 1
Peregrine Falcon	Lethbridge 1
Gyrfalcon	Calgary 1; Edmonton 1; Horseshoe Canyon 2; Wembley 1; Wildlife Reserve 1
Falcon Sp.	Snake's Head 1; Wildlife Reserve 1
White-tailed Ptarmigan	Bow Smmit 1; Trapline 1
Wild Turkey	Medicine Hat 9
American Coot	St. Albert 2; Wabamun Lake 9
Killdeer	Calgary 1
Common Snipe	Banff/Canmore 3
Glaucous Gull	Wabamun Lake 1
Mourning Dove	Horseshoe Canyon 1; Lethbridge 2
Northern Pygmy Owl	Sheep River 2; Snake's Head 2
Barred Owl	Edson 1
Short-eared Owl	Beaverlodge 1; Erskine 1; Horseshoe Canyon 1; Prairie Oasis 2; Wildlife Reserve. 1
Boreal Owl	Edmonton 1
Northern Saw-whet Owl	Edmonton 10; Elk Island 2; Wabamun Lake 1
Owl Sp.	Elk Island 1; Wildlife Reserve 1
Belted Kingfisher	Banff/Canmore 1; Calgary 3; Raven 1
Black-backed Woodpecker	Banff/Canmore 1; Edmonton 1; Elk Island 1; Wabamun Lake 1
Steller's Jay	Banff/Canmore 1; Hinton 3; Waterton Lakes 11; Gull Lake 2
Clark's Nutcracker	Banff/Canmore 15; Bow Summit 13
Mountain Chickadee	Banff/Can. 106; Bow Summit 5; Sheep River 19; Waterton Lakes 5; Wildlife Reserve 15
Chickadee Sp.	Banff/Canmore 48; Bow Summit 8
Townsend's Solitaire	Banff/Canmore 3; Calgary 1; Edmonton 2

Varied Thrush	Calgary 10; Edmonton 1
Cedar Waxwing	Calgary 10; Edmonton 28; Lethbridge 25
Shrike Sp.	Bindloss 1
Yellow-rumped Warbler	Calgary 1
Northern Cardinal	Lethbridge 1
Song Sparrow	Banff/Canmore 1; Calgary 1; Sylvan Lake 1
Harris' Sparrow	Banff/Canmore 2; Tofield 1
Sparrow Sp.	Eaglesham 1
Lapland Longspur	Medicine Hat 9
Red-winged Blackbird	Calgary 1; Lethbridge 15
Western Meadowlark	Bindloss 1; Stettler 1; Lethbridge 1
Yellow-headed Blackbird	Lethbridge 3
Brewer's Blackbird	Bindloss 1; Lethbridge 8
Common Grackle	Lethbridge 1; Medicine Hat 1
Rosy Finch	Banff/Canmore 120; Fort Vermilion 1; Waterton Lakes 30; Writing-on-Stone 175; Olds 1
Red Crossbill	Banff/Canmore 5; Calgary 115; Edmonton 67; Elk Island 18; Wildlife Reserve 8
Redpoll Sp.	Beaverlodge 1; Edson 209; Writing-on-Stone 21
American Goldfinch	Lethbridge 2; Writing-on-Stone 12

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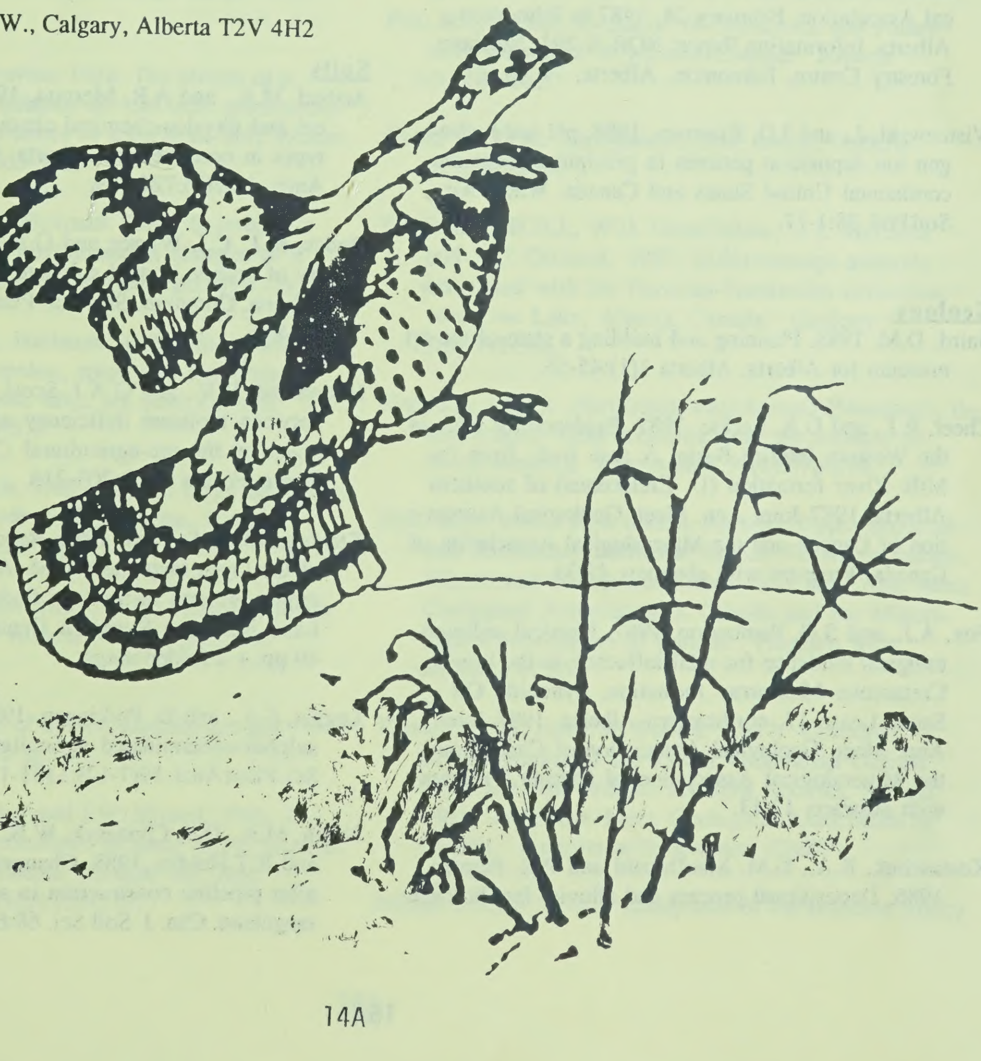

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Potential Species For Inclusion in the Rare Vascular Flora of Alberta

Family	Scientific Name	Common Name
Alismaceae		
	Sagittaria latifolia	Broad-leaved Arrowhead
Asclepiadaceae		
	Asclepias viridiflora	Green Milkweed
Boraginaceae		
	Cryptantha kelseyana	Kelsey's Cryptanthe
	Cryptantha minima	Small Cryptanthe
	Mertensia lanceolata	Narrow-leaved Lungwort
	Mertensia longiflora	Large-flowered Lungwort
Capparidaceae		
	Polanisia dodecandra	Clammyweed
Caprifoliaceae		
	Lonicera utahensis	Red Twin-berry
Caryophyllaceae		
	Arenaria longipedunculata	Sandwort
	Minuartia elegans	Showy Sandwort
	Sagina nivalis	Snow Pearlwort
	Sagina nodosa	Pearlwort
	Silene antirrhina	Sleepy Catchfly
	Silene furcata	Mountain Cockle
	Spergularia marina	Salt-marsh Sandy Spurry
	Stellaria americana	Alpine Chickweed
	Stellaria arenicola	Sand Chickweed
	Stellaria crispa	Curled Chickweed
	Stellaria obtusa	Meadow Chickweed
	Stellaria umbellata	Umbellate Chickweed
Celastraceae		
	Pachistima myrsinites	Mountain Lover
Chenopodiaceae		
	Atriplex canescens	Shadscale
	Atriplex powellii	Powell's Atriplex
	Atriplex truncata	Wedgescale
	Chenopodium atrovirens	Goosefoot
	Chenopodium incanum	Mealy Goosefoot
	Chenopodium leptophyllum	Narrow-leaved Goosefoot
	Chenopodium subglabrum	Goosefoot
	Chenopodium watsonii	Watson's Goosefoot
	Corispermum nitidum	Bugseed
	Suaeda moquinii	Moquin's Sea Blite
Commelinaceae		
	Tradescantia occidentalis	Western Spiderwort

Family	Scientific Name	Common Name
Compositae	Adenocaulon bicolor	Pathfinder Plant
	Agoseris lackschewitzii	Lackschewitz's False-dandelion
	Antennaria aromatica	Aromatic Everlasting
	Antennaria corymbosa	Corymbose Everlasting
	Antennaria dimorpha	Cushion Everlasting
	Antennaria luzuloides	Silver Pussytoes
	Arnica longifolia	Long-leaved Arnica
	Arnica parryi	Nodding Arnica
	Artemisia borealis	Northern Wormwood
	Artemisia furcata	Forked Wormwood
	Artemisia tridentata	Big Sagebrush
	Aster campestris	Meadow Aster
	Aster pauciflorus	Few-flowered Aster
	Aster umbellatus	Flat-topped White Aster
	Bahia oppositifolia	Picradeniopsis
	Bidens frondosa	Tall Beggar-ticks
	Brickellia grandiflora	Large-flowered Brickellia
	Cirsium scariosum	Thistle
	Crepis atrabarba	Slender Hawksbeard
	Crepis occidentalis	Western Hawksbeard
	Erigeron divergens	Spreading Fleabane
	Erigeron flagellaris	Trailing Fleabane
	Erigeron hyssopifolius	Wild Daisy
	Erigeron ochroleucus	Yellow-bracted Alpine Fleabane
	Erigeron purpuratus	Purple Alpine Fleabane
	Erigeron radicatus	Dwarf Fleabane
	Erigeron scotteri	Scotter's Fleabane
	Erigeron trifidus	Three-forked Fleabane
	Eupatorium purpureum	Joe Pye-weed
	Franseria acanthicarpa	Bur-ragweed
	Gnaphalium microcephalum	Tall Cudweed
	Gnaphalium viscosum	Clammy Cudweed
	Haplopappus uniflorus	One-flowered Iron-plant
	Hymenopappus filifolius	Tufted Hymenopappus
	Lygodesmia rostrata	Annual Skeleton-weed
	Machaeranthera tanacetifolia	Tansy-leaved Aster
	Nothocalais cuspidata	Prairie False Dandelion
	Prenanthes alata	Wing-leaved Rattlesnake-root
	Prenanthes sagittata	Arrow-leaved Rattlesnake-root
	Psilocarphus elatior	Woolly-heads
	Saussurea americana	Tall Saw-wort
	Senecio conterminus	Border Groundsel
	Senecio cymbalarioides	Alpine Groundsel
	Stephanomeria runcinata	Rush-pink
	Tanacetum huronense	Indian Tansy

Family Scientific Name	Common Name
Compositae	
Thelesperma marginatum	Tickseed
Townsendia condensata	Alpine Townsendia
Crassulaceae	
Sedum divergens	Spreading Stonecrop
Sedum stenopetalum	Douglas Stonecrop
Cruciferae	
Braya humilis var. maccallae	Dwarf Braya
Braya purpurascens	Purple-leaved Braya
Cardamine parviflora	Small Bitter Cress
Cardamine pratensis	Meadow Bitter Cress
Draba densifolia	Dense-leaved Whitlow-grass
Draba fladnizensis	Flatnitz Whitlow-grass
Draba kananaskis	Kananaskis Whitlow-grass
Draba longipes	Long-stalked Whitlow-grass
Draba reptans	Creeping Whitlow-grass
Draba ventosa	Windy Whitlow-grass
Halimolobos virgata	Halimolobos
Lesquerella arctica	Arctic Bladderpod
Rorippa tenerrima	Slender Yellow Cress
Rorippa truncata	Truncate Yellow Cress
Thellungiella salsuginea	Mouse-ear Cress
Cyperaceae	
Carex adusta	Browned Sedge
Carex aperta	Open Sedge
Carex athabascensis	Athabasca Sedge
Carex bipartita	Lachenal's Sedge
Carex crawei	Crawe's Sedge
Carex deflexa	Bent Sedge
Carex enanderi	Enander's Sedge
Carex epapillosa	Blackened Sedge
Carex geyeri	Geyer's Sedge
Carex glacialis	Glacier Sedge
Carex hystricina	Porcupine Sedge
Carex illota	Sheep Sedge
Carex kelloggii	Kellogg's Sedge
Carex lacustris	Lake Sedge
Carex lenticularis	Lens-fruited Sedge
Carex loliacea	Rye-grass Sedge
Carex mertensii	Merten's Sedge
Carex misandra	Nodding Sedge
Carex nebraskensis	Nebraska Sedge
Carex oligosperma	Few-fruited Sedge
Carex paysonis	Payson's Sedge
Carex preslii	Presl's Sedge

Family	Scientific Name	Commom Name
Cyperaceae		
	Carex pseudo-cyperus	Cyperus-like Sedge
	Carex rostrata	Beaked Sedge
	Carex scoparia	Broom Sedge
	Carex supina	Weak Sedge
	Carex tincta	Tinged Sedge
	Carex trisperma	Three-seeded Sedge
	Carex vesicaria	Blister Sedge
	Carex vulpinoidea	Fox Sedge
	Cyperus schweinitzii	Sand Nut-grass
	Cyperus squarossus	Awned Nut-grass
	Eleocharis compressa	Flattened Spike-rush
	Eleocharis ovata var. engelmannii	Engelmann's Spike-rush
	Eriophorum callitrix	Beautiful Cottongrass
	Rhynchospora capillacea	Slender Beak-rush
	Scirpus clintonii	Clinton's Bulrush
	Scirpus cyperinus	Wool-grass
	Scirpus fluviatilis	River Bulrush
	Scirpus nevadensis	Nevada Bulrush
	Scirpus pallidus	Pale Bulrush
	Scirpus pumilus ssp. rollandi	Rolland's Dwarf Bulrush
	Scirpus rufus	Red Bulrush
Droseraceae		
	Drosera linearis	Slender-leaved Sundew
Elatinaceae		
	Elantine triandra	Waterwort
Ericaceae		
	Ledum glandulosum	Glandular Labrador Tea
	Loiseleuria procumbens	Alpine Azalea
	Rhododendron lapponicum	Lapland Rose-bay
	Vaccinium ovalifolium	Tall Huckleberry
Gentianaceae		
	Gentiana aquatica	Marsh Gentian
	Gentiana calycosa	Mountain Gentian
	Gentianella detonsa	Northern Fringed Gentian
Geranianceae		
	Geranium carolinianum	Carolina Wild Geranium
	Geranium erianthum	Woolly Geranium
Gramineae		
	Agropyron scribneri	Scribner's Wheat Grass
	Agrostis humilis	Low Bent Grass
	Agrostis mertensii	Northern Bent Grass
	Agrostis thurberiana	Thurber's Bent Grass
	Alopercurus carolinianus	Carolina Foxtail
	Arctagrostis arundinacea	Polar Grass

Family Scientific Name	Common Name
Gramineae	
Aristida longiseta	Red Three-awn
Bromus altissimus	Fringed Brome
Bromus vulgaris	Mountain Brome
Calamagrostis lapponica	Lapland Reed Grass
Danthonia californica	California Oat Grass
Danthonia spicata	Poverty Oat Grass
Danthonia unispicata	One-spike Oat Grass
Dichanthelium acuminatum	Thermal Millet
Dichanthelium leibergii	Leiberg Millet
Dichanthelium oligosanthes	Sand Millet
Elymus mollis	American Dune Grass
Festuca altaica	Northern Rough Fescue
Festuca minutiflora	Tiny-flowered Fescue
Festuca occidentalis	Western Fescue
Festuca subulata	Bearded Fescue
Glyceria elata	Tall Manna Grass
Hierochloe alpina	Alpine Sweetgrass
Hordeum pusillum	Little Barley
Melica smithii	Smith's Melic
Melica spectabilis	Showy Onion-grass
Melica subulata	Alaska Onion-grass
Muhlenbergia asperifolia	Scratch Grass
Muhlenbergia racemosa	Muhly Grass
Munroa squarrosa	False Buffalo Grass
Oryzopsis canadensis	Canadian Rice Grass
Oryzopsis exigua	Little Rice Grass
Oryzopsis micrantha	Little-seed Rice Grass
Poa gracillima	Pacific Bluegrass
Poa lettermanii	Letterman's Bluegrass
Poa nevadensis	Nevada Bluegrass
Poa stenantha	Narrow-leaved Bluegrass
Puccinellia hauptiana	Haupt's Alkali Grass
Puccinellia pauciflora	Small-flowered Manna Grass
Schedonnardus paniculatus	Tumble Grass
Spartina pectinata	Prairie Cord Grass
Sporobolus neglectus	Neglected Dropseed
Trisetum canescens	Tall Trisetum
Trisetum cernuum	Nodding Trisetum
Trisetum montanum	Mountain Trisetum
Trisetum wolfii	Wolf's Trisetum
Grossulariaceae	
Ribes inerme	White-stemmed Gooseberry
Ribes laxiflorum	Trailing Black Currant
Ribes viscosissimum	Sticky Currant

Family	Scientific Name	Common Name
Hippuridaceae		
	Hippuris montana	Mountain Mare's-tail
Hydrangeaceae		
	Philadelphus lewisii	Mock Orange
Hydrocharitaceae		
	Elodea longivaginata	Long-sheathed Waterweed
Hydrophyllaceae		
	Hydrophyllum capitatum	Woollen-breeches
	Nemophila breviflora	Small Baby-blue-eyes
	Phacelia linearis	Narrow-leaved Scorpionweed
	Phacelia lyallii	Lyall's Scorpionweed
Hypericaceae		
	Hypericum formosum	Western St. John's-wort
	Hypericum majus	Large Canada St. John's-wort
Iridaceae		
	Iris missouriensis	Western Blue Flag
Isoetaceae		
	Isoetes bolanderi	Bolander's Quillwort
	Isoetes echinospora	Braun's Quillwort
Juncaceae		
	Juncus biglumis	Two-flowered Rush
	Juncus brevicaudatus	Short-tailed Rush
	Juncus filiformis	Thread Rush
	Juncus nevadensis	Nevada Rush
	Juncus regelii	Regel's Rush
	Luzula acuminata	Wood Rush
	Luzula groenlandica	Greenland Wood Rush
	Luzula hitchcockii	Hitchcock's Wood Rush
Labiatae		
	Hedeoma hispidum	Pennyroyal
Leguminosae		
	Astragalus kentrophyta	Prickly Milk Vetch
	Astragalus lotiflorus	Low Milk Vetch
	Astragalus purshii	Pursh's Milk Vetch
	Lupinus lepidus	Prairie Lupine
	Lupinus polyphyllus	Large-leaved Lupine
	Lupinus wyethii	Wyeth's Lupine
	Oxytropis jordallii	Jordal's Locoweed
	Oxytropis lagopus	Hare-footed Locoweed
	Psoralea argophylla	Silver-leaved Scurf-pea
Lemnaceae		
	Wolffia borealis	Northern Water-meal
	Wolffia columbiana	Columbia Water-meal

Family	Scientific Name	Common Name
Lentibulariaceae		
	Pinguicula villosa	Small Butterwort
	Utricularia cornuta	Horned Bladderwort
Lilaeaceae		
	Lilaea scilloides	Flowering Quillwort
Liliaceae		
	Allium geyeri	Geyer's Wild Onion
	Calochortus apiculatus	Mariposa Lily
	Camassia quamash	Blue Camas
	Disporum hookeri	Hooker's Fairy-bells
	Streptopus roseus	Rose Mandarin
	Streptopus streptopoides	Small Twisted-stalk
	Trillium ovatum	Western White Trillium
	Xerophyllum tenax	Bear-grass
	Yucca glauca	Soapweed
Lobeliaceae		
	Dowingia laeta	Dowingia
	Lobelia dortmanna	Water Lobelia
Lycopodiaceae		
	Lycopodium inundatum	Bog Club-moss
Malvaceae		
	Iliamna rivularis	Mountain Hollyhock
Montropaceae		
	Monotropa hypopitys	Pine-sap
	Pterospora andromedea	Pine-drops
Nyctaginaceae		
	Abronia micrantha	Sand Verbena
	Mirabilis nyctaginea	Umbrellawort
Nymphaeaceae		
	Nymphaea tetragona	Small White Water-lily
Onagraceae		
	Boisduvalia glabella	Smooth Boisduvalia
	Epilobium glaberrimum	Willowherb
	Epilobium halleanum	Hall's Willowherb
	Epilobium leptocarpum	Slender-fruited Willowherb
	Epilobium luteum	Yellow Willowherb
	Epilobium mirabile	Willowherb
	Epilobium saximontanum	Rocky Mountain Willowherb
	Gayophytum racemosum	Groundsmoke
	Oenothera andina	Upland Evening-primrose
	Oenothera breviflora	Taraxia
	Oenothera flava	Low Yellow Evening-primrose
	Oenothera serrulata	Shrubby Evening-primrose
Ophioglossaceae		
	Botrychium ascendens	Ascending Grape Fern

Family	Scientific Name	Common Name
Ophioglossaceae		
	Botrychium campestre	Field Grape Fern
	Botrychium hesperium	Western Grape Fern
	Botrychium lanceolatum	Lance-leaved Grape Fern
	Botrychium paradoxum	Paradoxical Grape Fern
	Botrychium simplex	Dwarf Grape Fern
Orchidaceae		
	Cypripedium acaule	Stemless Lady's-slipper
	Cypripedium montanum	Mountain Lady's-slipper
	Habenaria saccata	Slender Bog Orchid
	Habenaria unalaschensis	Alaska Bog Orchid
	Listera caurina	Western Twayblade
	Listera convallariodes	Broad-lipped Twayblade
	Malaxis monophylla	White Adder's-mouth
	Malaxis paludosa	Bog Adder's-mouth
	Spiranthes lacera	Northern Slender Ladies'-tresses
Orobanchaceae		
	Boschniakia rossica	Russian Ground-cone
	Orobanche uniflora	One-flowered Cancer-root
Papaveraceae		
	Papaver freedmanianum	Freedman's Alpine Poppy
	Papaver pygmaeum	Dwarf Alpine Poppy
Pinaceae		
	Larix occidentalis	Western Larch
	Pinus monticola	Western White Pine
	Tsuga heterophylla	Western Hemlock
Plantaginaceae		
	Plantago maritima	Seaside Plantain
Polemoniaceae		
	Microsteris gracilis	Slender Phlox
	Phlox alyssifolia	Blue Phlox
	Polemonium viscosum	Skunkweed
Polygalaceae		
	Polygala paucifolia	Fringed Milkwort
Polygonaceae		
	Eriogonum cernuum	Nodding Umbrella-plant
	Koenigia islandica	Iceland Koenigia
	Polygonum austiniae	Austin's Knotweed
	Polygonum confertiflorum	Close-flowered Knotweed
	Polygonum minimum	Least Knotweed
	Polygonum watsonii	Watson's Knotweed
	Rumex paucifolius	Alpine Sheep Sorrel
Polypodiaceae		
	Adiantum pedatum	Maidenhair Fern

Family	Scientific Name	Common Name
Polypodiaceae		
	Athyrium distentifolium	Alpine Lady Fern
	Cheilanthes gracillima	Lace Fern
	Cystopteris montana	Mountain Bladder Fern
	Dryopteris cristata	Crested Shield Fern
	Dryopteris filix-mas	Male Fern
	Dryopteris fragrans	Fragrant Shield Fern
	Gymnocarpium jessoense	Limestone Oakfern
	Pellaea atropurpurea	Purple Cliff Brake
	Phegopteris connectilis	Long Beech Fern
	Polypodium hesperium	Rocky Mountain Polypdy
	Polypodium virginianum	Virginia Polypody
	Pteridium aquilinum	Bracken Fern
	Woodsia glabella	Smooth Woodsia
	Woodsia ilvensis	Rusty Woodsia
Portulacaceae		
	Lewisia pygmaea ssp. pygmaea	Dwarf Bitter-root
	Lewisia rediviva	Bitter-root; Spatlum
	Montia linearis	Slender-leaved Spring Beauty
	Montia parvifolia	Small-leaved Spring Beauty
Potamogetonaceae		
	Potamogeton obtusifolius	Blunt-leaved Pondweed
	Potamogeton robbinsii	Robbin's Pondweed
Primulaceae		
	Centunculus minimus	Chaffweed
	Douglasia montana	Mountain Dwarf-primrose
	Lysimachia lanceolata	Lance-leaved Loosestrife
	Primula egaliksensis	Greenland Primrose
	Primula stricta	Erect Primrose
Pyrolaceae		
	Pyrola bracteata	Large Wintergreen
	Pyrola picta	White-veined Wintergreen
Ranunculaceae		
	Anemone quinquefolia	Wood Anemone
	Aquilegia formosa	Western Columbine
	Aquilegia jonesii	Jones' Columbine
	Myosurus aristatus	Awned Mousetail
	Ranunculus nivalis	Snow Buttercup
	Ranunculus occidentalis	Western Buttercup
	Ranunculus verecundus	Modest Buttercup
	Thalictrum dasycarpum	Tall Meadow-rue
Rhamnaceae		
	Ceanothus velutinus	Snowbrush
Rosaceae		
	Aruncus sylvester	Goatsbeard

Family	Scientific Name	Common Name
Rosaceae		
	Crataegus douglasii	Douglas Hawthorn
	Physocarpus malvaceus	Mallow-leaved Ninebark
	Potentilla finitima	Sandhills Cinquefoil
	Potentilla multifida	Branched Cinquefoil
	Potentilla paradoxa	Bushy Cinquefoil
	Potentilla plattensis	Low Cinquefoil
	Potentilla villosa	Hairy Cinquefoil
	Sorbus sitchensis	Western Mountain Ash
	Spiraea densiflora	Pink Meadowsweet
Rubiaceae		
	Galium bifolium	Two-leaved Bedstraw
Ruppiaceae		
	Ruppia maritima	Widgeon Grass
Salicaceae		
	Salix alaxensis	Alaska Willow
	Salix boothii	Booth's Willow
	Salix lanata	Woolly Willow
	Salix raupii	Raup's Willow
	Salix sitchensis	Sitka Willow
	Salix stolonifera	Sprouting Willow
Saxifragaceae		
	Conimitella williamsii	William's Conimitella
	Heuchera glabra	Alpine Alumroot
	Lithophragma glabrum	Prairie Rockstar
	Lithophragma parviflorum	Small-flowered Rockstar
	Saxifraga mertensiana	Merten's Saxifrage
	Saxifraga nivalis	Alpine Saxifrage
	Saxifraga odontoloma	Saxifrage
	Saxifraga oregana	Oregon Saxifrage
	Suksdorfia ranunculifolia	White Suksdorfia
	Suksdorfia violacea	Blue Suksdorfia
	Telesonix heucheriformis	Telesonix
	Tellima grandiflora	Fringecup
Scrophulariaceae		
	Bacopa rotundifolia	Water-hyssop
	Castilleja cusickii	Yellow Paintbrush
	Castilleja hispida	Rough Red Indian Paintbrush
	Castilleja sessiliflora	Downy Paintbrush
	Linaria canadensis	Old-field Toadflax
	Mimulus floribundus	Many-flowered Monkey-flower
	Mimulus glabratus	Smooth Monkey-flower
	Mimulus guttatus	Yellow Monkey-flower
	Pedicularis lanata	Woolly Lousewort
	Pedicularis racemosa	Leafy Lousewort
	Pedicularis sudetica	Purple Rattle

Family Scientific Name	Common Name
Scrophulariaceae	
Penstemon albertinus	Alberta Beardtongue
Penstemon eriantherus	Crested Beardtongue
Penstemon fruticosus	Shrubby Beardtongue
Penstemon lyallii	Lyall's Beardtongue
Veronica catenata	Water Speedwell
Selaginellaceae	
Selaginella rupestris	Little Clubmoss
Selaginella wallacei	Wallace's Little Clubmoss
Sparganiaceae	
Sparganium fluctuans	Floating Bur-reed
Sparganium glomeratum	Globe Bur-reed
Sparganium hyperboreum	Northern Bur-reed
Taxaceae	
Taxus brevifolia	Western Yew
Umbelliferae	
Angelica dawsonii	Dawson's Angelica
Bupleurum americanum	Thoroughwax
Lomatium cous	Biscuit-root
Lomatium sandbergii	Sandberg's Wild Parsley
Osmorhiza chilensis	Blunt-fruited Sweet Cicely
Osmorhiza longistylis	Smooth Sweet Cicely
Osmorhiza occidentalis	Western Sweet Cicely
Osmorhiza purpurea	Purple Sweet Cicely
Urticaceae	
Parietaria pensylvanica	American Pellitory
Violaceae	
Viola glabella	Yellow Mountain Violet
Viola macloskeyi	Macloskey's Violet
Viola pedatifida	Crowfoot Violet
Viola praemorsa ssp. linguaefolia	Tongue-leaved Violet
Voila selkirkii	Great-spurred Violet

The Alberta Native Plant Council is starting work on a Guide to the Rare Vascular Flora of Alberta. You can help to make this project a success. Do you have information about the location or status of any of these species? This is a preliminary list, consisting of all species included in Packer and Bradley's 1984 Checklist of Rare Vascular Plants in Alberta plus new species that have been discovered in the province since that time. We would really appreciate feedback. Are there species that you think should be added to this list or species that should be deleted? We would like to hear your opinions.

Do you have good quality photos or drawings of any of Alberta's rare plants? We want to illustrate as many species as possible. Therefore, we need to know what photos are already available so that we can focus our efforts on filling gaps.

If you have information, please send it to:

Linda Kershaw,
51163 Range Road 204,
Sherwood Park, AB
T8G 1E5 (or phone 662-3626)

or to:

The Alberta Native Plant Council,
Box 52099, Garneau Post Office,
Edmonton, AB T6G 2T5

Recent Publications on Alberta Natural History

compiled by David Ealey

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Flat-topped White Aster (*Aster umbellatus*) Photo by J.D. Johnson

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Spring 1993

ALBERTA NATURALIST

Alberta's Natural History Review

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CONTENTS

President's Page 1

Jack Park Receives Loran L. Goulden Award, D. Ealey...2

Ringing in 1993 & ABAP Update 3

Population of Wolves & Elk, D. Dekker 4

Banding Birds in Alberta, E. Jones 7

Piping Plover, E. Jones 8

Computer Software for Birdwatchers, C. Finlay 9

The Loons of Coyote Lake, D. Hopkins 11

Saw-whet Owl Nesting Records, M.D. O'Shea 12

For The Birds, Sherry Kozak 13

CNF Conference, Don Stiles 15

Protecting The Environment, C. Smith, A. Kwasniak.....16

Letter to the Editor 18

Announcements 19

Book Review 20

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St. Albert, AB T8N 0Y6. Telephone: 458-3935
Executive Assistant: Ann Stefura

Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, FAN, Box 1472, Edmonton, AB T5J 2N5.
May Species Count-Plants; July 15, J. Derek Johnson, Northern Forestry Centre, 5420 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Patron: Hon. Dr. J. W. Grant MacEwan

The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(b) To encourage among all albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(c) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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Vermilion River Naturalists, Box 1769, Vermilion, AB T0B 4M0.

Associate Members: Beaverhill Bird Observatory
Earth Care Peace Study Centre

PRESIDENT'S PAGE

R. Barry Jenkins

I have been involved in a number of projects lately that should be mentioned.

Special Places 2000

In my capacity as both president and chairman of the wilderness committee I have met with the presidents and various directors of the Canadian Parks and Wilderness Society (CPAWS) and the Alberta Wilderness Association (AWA) in a joint meeting to look at ways of encouraging the government to actively promote the policies set out in the Special Places 2000 draft paper. When this paper was released the three organizations held joint press conferences commending the government for this new policy. What we want to do now that Klien is the premier is confirm his government's commitment to live up to the goals set out in this paper.

One way we propose to do this is a joint letter from the three organizations asking for confirmation of his commitment. We are also recommending the immediate creation of a number of protected areas where the public process is now complete and the creation of a small focused task force to spearhead the implementation of new protected lands. This letter is written and signed but has not yet been delivered.

Public Hearing Handbook

The Alberta Environment network and the Environment Council are working on a handbook for use by novices in the area of public hearings. This book is designed to be easy to read and use and will hopefully be useful for anyone getting involved in public participation from local development appeals to NTCB hearings. It is aimed at the general public but should also be useful for proponents of project to help them set up meaningful public participation.

Wagner Natural Area Society

The overpass and roadway system to the east of this natural area is currently being built but it is using little of the land from the natural area having been moved east from the original proposed site. It is a tremendous eye sore and degrades the Natural Area but it does give a defined boundary to the area and will prevent encroachment from that side. There has been some talk of a service road paralleling highway 16X but there is not sufficient room between the natural area and the highway for this and I don't believe there is any chance of a serious proposal for such a road.

Public lands is currently looking for funding to acquire land which is now available just to the south east of the current natural area site. If funding can be found there is the possibility of further expansion to this rather small natural area.

Bull Trout Task Force

A Bull Trout Task Force is being organized, and there is concern that this task force is likely to recommend further study rather than affirmative action to preserve the species. As most of the members on this committee seemed to be either fishery biologists employed by the government or private consultants, those concerned seem justified. What we need now is positive action toward preservation. The task force will have met again by the time we go to press and FAN will be represented at this meeting.

Jack Park Receives Loran L. Goulden Award

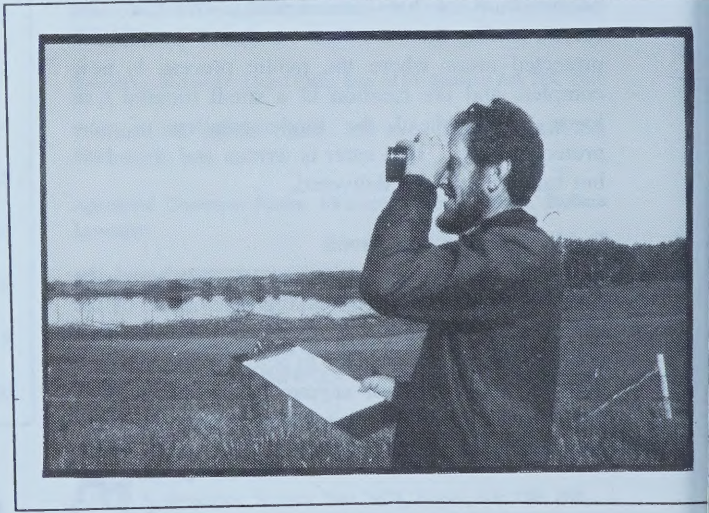
Dave Ealey

The eighteenth annual Loran L. Goulden Memorial Award was presented during the FAN meeting on January 30, 1993 to Jack Park of Edmonton. This award was in recognition of his long-term contributions as a naturalist, birder and all-around solid leader in the provincial naturalist community. A cabinet maker by trade, Jack has committed and trained himself for over 20 years to make a real contribution to Alberta's natural history, in the true tradition of Loran Goulden. As noted by one of his nominators for the award, Jack developed himself to be a keen, honest and thorough field-experienced birder. This has not been easy for him, especially given his shy manner and the intimidation many often feel around more academic types. But he persevered until he gained a respected role in the provincial birding community.

Jack has been primarily involved, over the years, in two of the key naturalist activities in Alberta. He was involved with the founding of Bluebird Trails in Alberta. Back in 1969, when Hon. Grant MacEwan ceremoniously inaugurated the first trail east of Sherwood Park, Jack had been instrumental in building many of the boxes. He coordinated Junior Naturalists over the years to prepare boxes for various trails. He has dutifully undertaken the care of boxes on his route for over 20 years, and also has banded and recorded results.

In addition, Jack has been involved with the Breeding Bird Survey for over 20 years, nearly all of those years as the provincial coordinator, constantly recruiting new participants, running at least two surveys every year and maintaining records for the national and continental coordinators. In some years, Jack has run 4 to 5 surveys in a month!

He has also been involved in the executive of the Edmonton Bird Club, Edmonton Natural History Club and Federation of Alberta Naturalists, as well as being a long-term Zone Captain in the Edmonton Christmas Bird Count. In his quiet, unassuming way, Jack has made enduring contributions to the conservation and study of our natural environment.



Jack Park conducting a Breeding Bird Survey at Derwent, Alberta. Photo by Lorne Wallace

Author's Address:
3903 - 105 Street, Edmonton, Alberta T6J 2K7.

Ringing in 1993

From the Editor

The coming of the new year brings change in all facets of life, and the *Alberta Naturalist* is no exception. Chief among the changes in this new year, from my standpoint at least, is the appointment of myself, Jane Livingston, as editor.

When the past editor, Anna Robertson, decided to step down after the last issue, the board asked me to take over editorship of the *Alberta Naturalist*. Anna worked hard during her tenure as editor of the AN and she will be missed. I am pleased to be involved with FAN and will do my best to continue the professional quality that previous editors have shown in this publication.

Another change you may note is the colour of the front cover. Each year FAN changes the colour that runs in the magazine. Also, in this first of the year issue, you'll find the submission guidelines on the last page.

In this issue you'll find several topics that I think will be of interest. Since becoming involved with the *Alberta Bird Atlas* (I was the Associate Editor), I have developed a serious, if amateur, interest in birding. I was fortunate in convincing an Alberta film producer friend of mine, Ms. Sherry Kozak, to write a piece outlining her films on Alberta birds. These films should prove to be invaluably informative, and I'm sure you'll find the article fascinating.

We also have a very important article on various computer programs that are available to make your cataloguing of sightings easier, as well as book reviews and several other items of interest.

Assuming all goes well with our production schedule, spring will be just around the corner as we go to press. It will almost be time to seed my wildflower patch. I can't wait. Spring and summer in Alberta offer countless outdoor activities, and I love them all.

I welcome your feedback as well as possible submissions of articles, letters, or interesting pictures. Just drop a line to me or Ann from FAN at P.O. Box 1472, Edmonton, AB T5J 2N5. Or call (403)453-8629 and I'm sure Ann will be happy to pass on the message for me.

Alberta Bird Atlas Project Update

The Alberta Bird Atlas has sold out its first printing of 7000 books. The Management Committee decision to aim the book at a middle of the road audience has proved to be a very good decision as there has been very positive feedback from the schools, libraries and general buying public in Alberta.

For those that were not satisfied with the amount of "hard data" in the publication, be patient. The original partners in the Project, the Provincial Museum, Fish and Wildlife, the Canadian Wildlife Service and FAN are looking at the data base to assess what further analysis of the data may be undertaken and where the resources may be available to do this and report the findings. FAN, in conjunction with the Recreation, Parks and Wildlife Foundation, is assessing the possibility of reprinting the Atlas. If this does take place it will allow correction of errors that crept in when the firm doing the electronic pre-press shut its doors prematurely (copies of the alphabetical English Index are still available from the FAN office). FAN is still maintaining the 122,000+ records in the Bird Atlas data base. It has been customized so that species lists for particular squares or blocks can be produced at request as well as individual species maps. Also available are summaries of records for individual species sorted by Natural Region. To access these records and reports only a small administrative fee is charged.

The possibility of adding other records such as breeding bird surveys is being explored. FAN, in conjunction with other organizations, is looking at developing a new data card to be made available to birders in order to keep an up to date record of what is happening with birds in the province.

Historical and Contemporary Populations of Wolves and Elk
In Jasper National Park

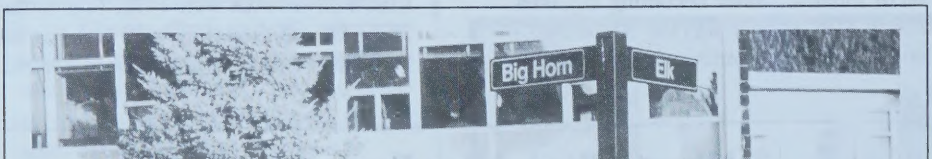
Dick Dekker

The Second North American Symposium on Wolves was held in Edmonton at the University of Alberta on August 25-27, 1992. (The First was held a little over ten years ago in the same city.) The event was organized by **Dr. Ludwig Carbyn,** research scientist with the Canadian Wildlife Service.

The symposium drew 380 registrations from 12 countries. A total of 61 papers were presented orally and an additional 21 in poster format.

Following is an excerpt from a paper given by the author who has observed wildlife in Jasper National Park (JNP) from 1965 to the present. The paper incorporates and combines data from research by Ian McTaggart-Cowan (who did Canada's first field work on wolves in JNP exactly 50 years ago), Lu Carbyn, John Stelfox, the Jasper Park Service and the Alberta Fish and Wildlife Division.

Unfortunately, it is not possible to obtain a pre-European impression of wildlife in JNP. It took until 1811 before the first white man entered the upper Athabasca valley. Half a century or more before that time, bands of immigrant Indians and Metis from eastern Canada had been using the valley as a travel corridor. Living off the land, these aboriginal people, armed with rifles obtained from white fur traders, must have had a severe impact on mountain wildlife, particularly on herding species such as elk that concentrate on winter ranges and are vulnerable to hunters in semi-open terrain. By 1827, there were very few elk in JNP and fur traders reported starving Indians during winter. After the mid 1800s, all large mammals became scarce. By the turn of the century, elk had been practically exterminated in all of western Alberta. Wolves were very rare, partly because of the use of poison, but mainly as a result of the



In parks where no hunting is permitted, elk lose their fear of humans and concentrate in towns and around tourist facilities to graze on lawns, and to seek protection from predators. In Banff National Park, where wolves have made a strong come-back in recent years, elk are now so numerous in town that people had to set up road signs for them... (Ha Ha!). Photo by Dick Dekker disappearance of their prey base.

After the park's establishment in 1907, 88 elk, shipped in from Yellowstone, were released in JNP. They multiplied to 3000 in the early 1940s when they were considered too numerous for available winter habitat. Researchers reported severely overgrazed range conditions in the Athabasca valley. To dampen the herd's productivity, up to 300 elk cows were butchered each winter by park wardens. Wolves made a come-back in the 1930s, but were killed on sight. Poison was used to kill wolves in JNP in the early 1950s and routine wolf poisoning was carried out on adjacent provincial lands until 1966.

During 1971-1975, a major fluctuation occurred in the JNP elk and wolf population. The elk cull had been stopped in 1970 when their numbers were estimated at 2500. In 1973-1975, the population declined to 850-1000. During the same time, the wolf population increased from 48-50 to 80-100.

Causes of the elk decline include record snowfalls, which were especially lethal to elk because of the poor range conditions. The wolves probably prevented elk recovery after the decline, particularly since the wolf population remained at a high level for 5-7 years after 1975. Hunting on park boundaries, in some districts, contributed to local elk declines that were as high as 85-94% in the Willow Creek district on the park's north boundary.

After 1982, wolves declined to 27-50, while elk numbers have remained low but stable at about 1000. Has the elk decline been bad for the park's ecosystem? Not necessarily. Formerly overgrazed meadows have recovered. There is now lots of grass on winter ranges that the elk share with bighorn sheep. In the early 1970s, sheep herds were believed to be on the verge of a major die-off due to malnutrition. It has not happened. The JNP bighorn population has remained stable and even increased somewhat to about 3000. There has also been a noticeable change in regeneration of poplar trees in JNP. Prior to 1975, all new shoots were browsed. After the elk decline, aspen poplar began to expand with vigour. Mule deer and beaver have benefitted. This, in turn, should benefit predators such as the wolf.

Wolf denning sites in JNP are typically at lower elevations, and the preferred sites are highly traditional, most are near elk calving grounds. In these districts, elk calf survival is low. Cow:calf ratios in two such districts were 100:19 or less, significantly lower than the 100:48 ratio obtained in areas away from wolf denning sites, along roads and near tourist facilities. The evidence, albeit circumstantial, suggests that the effect of wolf predation on elk calf survival in JNP is locally severe since elk in JNP have a clumped and restricted distribution, and since wolves traditionally use den sites near elk calving grounds.

A comparison of Jasper and Yellowstone

At the end of his presentation, the author made a brief comparison between Jasper and Yellowstone National Park where wolves are to be reintroduced but are now absent. At 8,800 km^2, Yellowstone is a little smaller than Jasper (10,880 km^2), but Yellowstone has a summer population of about 30,000 elk, compared to Jasper's 1000. Official predictions are that Yellowstone's wolf population, after recovery, will number 100-150 in packs of about 10 animals each. This estimate may be too low in view of the tremendous prey base. At the hey-day of wolves in Jasper, in the 1970s, packs of 18-25 wolves were reported from all major drainages. Similarly large wolf packs are typical of Wood Buffalo National Park as reported by Lu Carbyn. It is conceivable that Yellowstone's wolf population, given adequate protection on the boundaries, will grow to a much greater density than predicted. At any rate, due to the large expanse of open terrain, Yellowstone's Northern Range should become an excellent place to observe direct interaction between wolves and elk. Such observations are rare in Canadian National Parks such as Jasper and Banff because of the predominantly wooded terrain.

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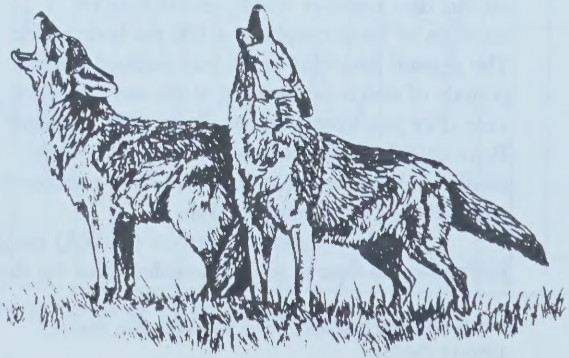
Adapted from WolfNews Volume 10, number 3, 1992.



34 Years of Banding Birds in Alberta .... 1958-1992 The Decline Over The Years

Edgar T. Jones

After 34 years of banding in Alberta at two different stations, namely, at Whitemud Creek in Edmonton and Beaverhill Lake, approximately 100k (60m) to the east, the time is overdue when the data gathered from these bandings should be made available.

Banding experiences prior to 1958 included a summer in 1939 of banding ducks in the Many Island Lake Area of Alberta for Ducks Unlimited, at which time I banded over 2,500 ducks. At that time Many Island Lake was one of the most productive areas in this province. It has been dry for many years and still is. I also did some banding in my wanderings around the province, but it was not until our move to an acreage in South Edmonton in 1955 that the potential for banding passerines in numbers became available. This location was along Whitemud Creek, a north/south ravine which is well-wooded and very attractive to birds of all types. In the following years approximately 50,000 birds were banded at this location. In 1988, our family moved from this location to our present home. It was only then that I began to concentrate on a new area at Beaverhill Lake, where I had been banding earlier but only on occasional visits. The numbers of birds passing through the Edmonton area had noticeably declined[1]. I had decided Beaverhill Lake would be a good place to continue banding to determine if the same declines were happening elsewhere, or only just in Edmonton, where the advance of the city might have affected passerine movements, although my banding station remained unchanged.

It seemed to me that the best way to pull all this data together was by calculating the numbers of birds caught in a 100 net hour period. The general passerine catch was outlined during periods of continual banding at the same location year after year (see Graph). From 1988 on, since Beaverhill Lake figures seemed to be relatively similar to the Edmonton figures, I have continued and included these on the graph.

On the Tennessee Warbler (TEWA) graph line the catch figures were calculated from the date of the first one caught in the banding period to the date of the last one caught, with the exception of a few stragglers, early/late which were omitted if too strung out to maintain a consistent period of banding and a reasonable per net hour average. For example, early May, or late September/October records were omitted. With approximately 70,000 birds banded during this period from 1958 to 1992, I would estimate in the vicinity of 15,000 to 20,000 would have been the wide variety of neo-tropical warblers passing through our province. In all, 22 species were banded in Alberta. As this group is one of the most likely to suffer from the many hazards of migration and breeding mortality, I chose the Tennessee Warbler. Certainly in this part of the country the Tennessee Warbler was one of the most abundant migrants. The graph clearly indicates the decline over the years.

The documented decline of the Tennessee Warbler (TEWA) and passerines in general is due, in my opinion, to many different things. Listed on the following page are a few of the contributing factors:

Tennessee Warbler Photo by Edgar Jones

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[1] "The Passerine Decline", North American Bird Bander, 1986-11 (74-75).

(1) In Alberta, the mass destruction by clear cutting of tens of thousands of acres of prime breeding territory has to have had a devastating effect. Selective cutting would greatly reduce these losses.

(2) The devastation of the tropical rain forest where these birds winter would affect most species of warblers.

(3) The continued use of herbicides and pesticides in some regions along highway and railway thoroughfares is another factor in the disappearance of roadside breeding and feeding (berry trees) habitat.

(4) High speed traffic kills thousands of birds and animals, particularly when young are learning to fly. The spot checks that I have done in many areas of the province reveal staggering losses. A 90kph (55mph) speed limit would greatly reduce these losses.

(5) The domestic house cat is yet another hazard for ground feeding birds. Cats kept inside as they should be are no problem, but the millions of cats that are let out each evening which feed on wildlife are most destructive. A short trip of 80k (50m) to Beaverhill Lake yielded no less than 12 cats hunting in the ditches along the main highway. Studies all over the world indicate the losses are in the millions.

(6) Other factors include high radio and TV towers, window kills, etc., which also yield figures in the hundreds of thousands.

Many of these problems can be reduced, but if there is to be anything left of future generations action has to come soon.

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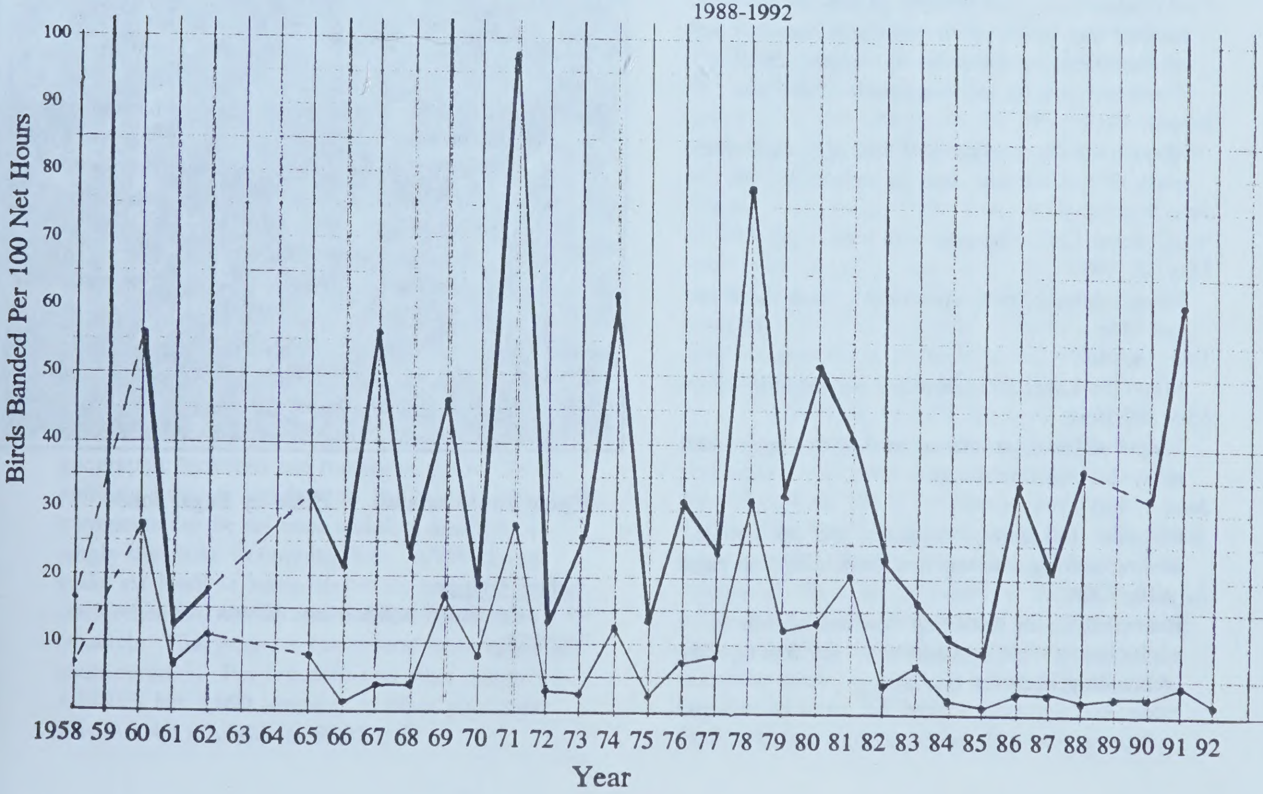
Banding Station at Edmonton, Alberta 1958-1987 - Whitemud Creek

---Trend on yearly data (---) missed years (all passerines)
---Tennessee Warbler (TEWA)(---) missed years - 1958-1992 (includes Beaverhill Lake)
1988-1992



Piping Plover

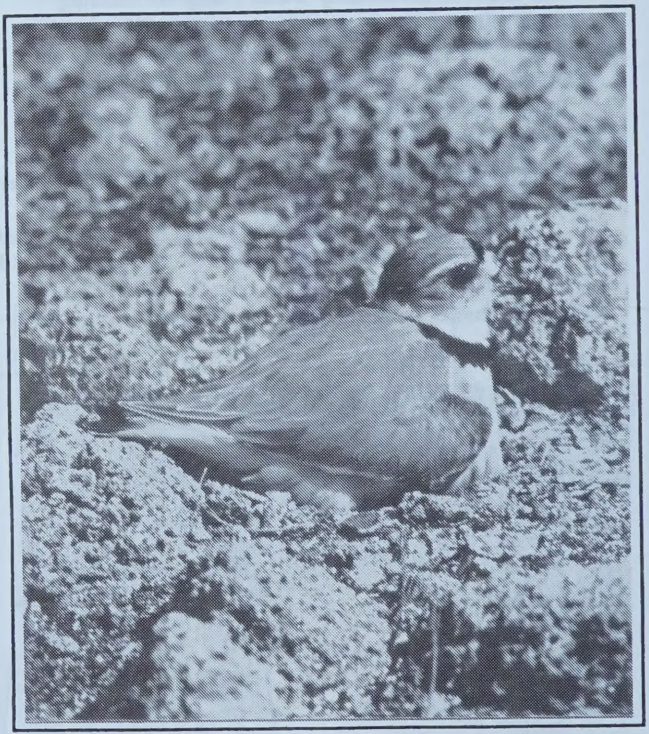
Historical Records 1952-1976

Edgar T. Jones

During my earlier birding days one of my favorite lakes in the Edmonton area was the Oliver Lake - Miquelon Lake complexes. In the early 1950s and into the 1960s the Piping Plover *(Charadrius melodus)* was quite abundant in this area.

Following are the nest records:
June 7, 1952
Miquelon Lake, nest of three eggs built on a flat approximately 70 yards (328.22m).
May 24, 1953
Miquelon Lake, nest of three eggs which was later checked on June 10 when there were four eggs.
June 10, 1953
Miquelon Lake, three downies, one to four days old were located on the north shore of the main lake.
June 26, 1954
Miquelon Lake, two families of this species just hatched and mobile with parents and another nest of three eggs just hatching in the nest scrape. These were on the north east side of the lake.
June 9, 1955
Miquelon Lake, two nests of four eggs each on the north side of the lake, one on an island.
June 9, 1956
Miquelon Lake, one nest with four eggs.
May 18, 1957
Miquelon Lake, nest with four eggs on the north east side.
June 14, 1957
Miquelon Lake, three downies on east side.
May 30, 1961
Miquelon Lake, an unusual nest of five eggs and it appeared only one female.
June 7, 1967
Miquelon Lake, only two males and one female observed along with one nest containing four eggs.
July 10, 1968
Beaverhill Lake, three tiny downies with three adults in attendance on east side - my first sighting of breeding birds for this area.
June 8, 1976
Miquelon Lake, there appeared to be only one pair in the entire area and one nest only of four eggs was found on the east side of the lake.

Several checks have since been made but no adults have been recorded.



Piping Plover on nest Photo by Edgar Jones

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Computer Software for the Birdwatcher or Lister

Cam Finlay

Studies show that 91.7% of Albertans participated in indirect (non-hunting) wildlife related activities and Canadians spent $4 billion on this hobby in 1987. With the advancement of computer technology and the number of people watching and/or travelling to see wildlife, now seems like a good time to review computer software programs available to those who keep life, backyard, city, and other lists of birds seen each year.

The key requirements to good software include ease of installation and use, speed in updating information, ability to enter lots of data, and to keep and update a wide assortment of lists. It should be able to do a wide variety of searches to see when and where a bird was seen and what it was doing, etc., and prepare reports and other tasks possibly needed in the future. And finally, cost is a major factor.

Several IBM (DOS) and MacIntosh packages are offered in birding and other magazines. Those reviewed here are listed in order of preference for beginners, those more advanced in birding and/or computer use, serious birders, and professional biologists.

1. Using DOS programs, **AVISYS**, a program published by Perceptive Systems, P.O. Box 1908, Lafayette, California, 94549, appears to be far and away the best all around program for all users mentioned above. Phone 1-800-354-7755 for more information on this program. Hardware required: 412K Ram and floppy disk of either size, or a hard drive. The manual is easily understandable. The program is easy to use and operates very fast. Functions work with a single keystroke. Over 870 species of North American birds are listed, and all are very accessible. Data needs only to be entered once, and all lists are updated. Lists for up to 420 geographic locations can readily be made. When entering a day or holiday trip, the date, location and comments can be set once and then added by a single keystroke to ongoing lists. AVISYS can make six kinds of spreadsheets for more comprehensive studies and detailed biological research. This program has several more appealing characteristics. For botanists and other people too. AVISYS has 3,000 openings to place your plant lists in. All available at 89.95 U.S.

2. **BIRDBASE ll** uses DOS and is the second choice on the list. It is published by Santa Barbara Software, 1400 Dover Rd., Santa Barbara California, 93103, Ph/FAX (805)963-4886. Hardware needed is 256K in RAM, with two floppy disks of either size or a hard drive. My family and I had a bit of a problem setting it up, but after a phone call to a very helpful publisher, we were soon up and running. This program has a very easy to read manual with several tutorials. Name changes and/or new names for species are readily updated. Nine different kinds of lists, including yard, locale, region, county, life, and four you designate, are available. It has a key disk to function which is annoying and could be critical if this disk is damaged. Cost is $62.95 U.S. for North American lists or $104.95 for the World List. (BIRDLEXI program, a spell checker with all scientific and common bird names, is also available from this company - for $52.95 U.S.)

3. **DATAHAWK** in DOS is published by Turnstone Software, 1838 Barry Ave., Suite 12, Los Angeles California, 90025, Ph. 1-800-654-5676. Hardware needed includes 512K on RAM and one disk of either size plus at least 1.5 megabytes on a hard drive. The manual for this program is easy to read, clear and complete. The program is simple to use and is designed to keep track of lists for two people. Any change will automatically update lifetime lists. Lists for up to 999 sites, provinces or states, years and HIT species are provided. No world list is provided and data can not be transferred to other programs. This is one of the better choices for those keeping and regularly updating many lists. Cost is $93 U.S.

4. **PLOVER** in DOS is a very powerful program for those who need maximum flexibility and control over their data. It is published by Sandpiper Software, 9 Goldfinch Court, Novato, California, 94947. Hardware needs are 360K RAM and two disks of either size or a hard drive. It is written on dBase lll+ and thus the information is easily transferrable. The manual is comprehensive and detailed but somewhat complex for novice computer users. It will take a bit of time for the beginner to learn, but more experienced computer users will feel right at home. It is very good for

statistical work, doing up to 13 calculations for each species and four summary statistics. It readily edits a variety of information that is stored. Search ability is excellent. The program has good flexibility to retrieve data and store information together with the ability to import or export data. The North American list costs $65 U.S. and the new Sibley-Monroe World list of 9600 species an additional $60.

5. **SIALIS** in DOS is published by Alfred Milch of 461 Palmer Ave., Teaneck, New Jersey, 07666, Ph. (201)836-1496. Hardware needs include 500K on RAM and two disks of either size or a hard drive. It is very easy to use, even for a beginner computer user. List making includes life, area, year and as many other types as you wish, limited to the memory capacity of your machine. Unfortunately, data is not transferrable to other software programs. The cost is $75 U.S.

6. The next DOS program is primarily designed for recording trip list information. **BIRDER** is by Paul C. Ellegen, 7404 NW 118 St., Oklahoma, 73162, Ph. 405-721-5847. Hardware needed includes 256K RAM, single or dual disk drives of either size. Manual is easy to read and short, though complete. The search ability of this program is its strength. It has a plus in that habitat, sex, age and behaviour may be added to lists. It is a nuisance to have to reload BIRDER when switching diskettes of data. The cost of this program is $64.50 U.S.

7. **FLEXI-LIST**, the last DOS program on the list, is designed only for creating customized lists of over 700 North American birds. Published by Parkway Software, P.O. Box 275, Villanova, Pennsylvania, 19085, Ph. 215-356-5880. Hardware needed includes 256K RAM and one floppy or a hard drive. This program will produce either columnar or text lists. Access of names using four letter codes is almost instantaneous. Data entry, creation and additions to files are somewhat awkward to perform, particularly for beginners. The cost is $53 U.S.

The next three programs are for Macintosh users and are listed from most to least advanced.

8. **BIRDBRAIN** is the most complete and offers the greatest flexibility and largest number of options for more serious birders. The publisher is Ideaform Inc., P.O. Box 1540, Fairfield, Iowa, 52556, Ph. 1-800-779-7256. Hardware needs are MacPlus with 2 Mb of memory or more and a hard drive with at least a 6.03 system with a recommended 6.07 or higher; it is compatible with System 7. It was created on Double Helix 3.5, a relational data base, but there is no need to buy the Helix as it is incorporated into the program. Data entry is fast, requiring entry of trip information for only the first bird seen. This information will then be automatically entered for the rest of the names on your trip. The tag and flag feature marks data any way you wish for later retrieval. Contains 1956 common and scientific names for the AOU list of North American birds plus Hawaii, Bermuda and the Bahamas. The World List includes these plus all others on the Sibley-Munroe list. If you want to add only a few names of non-North American birds, use **BIRDPICKER**, an additional small program by this company, which will allow you to add species from other places in the world. BirdBrain costs $125 U.S., World BirdBrain, which includes everything in BirdBrain, costs $175 U.S., BirdPicker, to use with BirdBrain, costs $30 U.S.

9. **MACMERLIN** is an excellent program and is a very inexpensive way to make a variety of lists. It is published by Whole Life Systems, Box 162, Rehoboth, New Mexico, 87322, Ph. 405-863-4751. Hardware needed includes a MacPlus or better with a hard drive and System 6.2 or better; it is compatible with System 7. Hyper Card 2.0 or 2.1 is also required. The disk includes a very handy manual illustrating how to use the various features. Data entry is provided for common and scientific names of 9044 species, including those on the North American AOU list, Hawaii and the Virgin Islands. The program accepts short bird name codes and then generates full names. Data entry is notebook-style, allowing trip data to be entered once and automatically repeated. Information on frequently visited areas is retained in memory. Life lists can be made, as well as others by date, site, location, region, province or state, and country. It will also produce customized lists and has good sorting functions. A real plus is the ability to produce reports in AOU order for a specific season, area and year, to be used in submitting information to magazines. All this for only $25 U.S.

10. **NA BIRDS**, a free program for the Macintosh, has been used by the author's actively birding son Warren for the past two years, and it has met all of his needs. It is published by Gerry Rising, who writes the weekly nature/birding column in the *Buffalo News*, 295 Robinhill Drive, Williamsville, N.Y., 14221, Ph. 716-689-8301. The latest update uses Excel 3.0 or 4.0 for spreadsheets,

but a file for Excel 1.5 is on the disk. The program is easy and quick to use and print checklists. The manual is written so it is readily understood and it contains several tutorials and examples. This program was designed to provide a basic source to customize and maintain a variety of files for your own records and examples of how to set up special files for a regional area of your choice. It includes birds found on the most recent update of the ABA list of common and latin names and codes and families for continental USA and Canada. You can create and sort personal life lists in checklist order or first observation order. Also new additions in order by year, regional list in checklist order, personal sightings within a region, regional lists by month, by departure and arrival date, and daily observations. It will also generate hike or trip lists in various forms. And best of all, it's FREE!

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The Loons of Coyote Lake

Doris Hopkins

Loons were nesting here on Coyote Lake when we discovered this small wilderness only sixty-five miles southwest of our home in Edmonton. To our delight--and relief--they have continued to nest here each of the fifteen years since we have retired to its shores. In that time, we have been privileged to observe and listen to many loons and to learn something of their ways. My husband, Eric, can make a pretty fair imitation of a loon's call, good enough that some of them answer him and swim in closer to check out this newcomer.

We particularly enjoy those times when loons from neighbouring lakes come a-visiting. About nine of a fine summer morning, loons come flying in to join our pair, calling greetings as they splash down on Coyote Lake. When five or more loons are gathered in mid-lake they form a ring, head to tail, and swim in a circle with much dipping of heads until, as though at a signal, they all dive simultaneously. They radiate out from the circle and surface some twenty-five feet away, then swim back to the centre to resume circling and dipping. After fifteen or twenty minutes of this behaviour, each visiting loon flies off with much yodelling of farewells until only our pair is left. When they have young, the parent loons hurry off to the nearby reed beds where the chicks have been "parked" during what we refer to as the "kaffee klatch".

Nesting time is the most exciting time for us, possibly because it is not always successful. For the past three years, our loons have nested on the shore directly across from our house. Using a spotting scope, we could clearly see the loon on the nest. Excitement mounted as hatching day neared. Suddenly we spotted one and then another wee ball of black fluff bobbing beside its parents. What joy--what a relief! Watching the chicks ride on the parent's back, or swim eagerly to take food from its bill is a source of joy to us, but these first days are fraught with danger for the harried adult birds. Despite their most diligent care, only once since we have been watching have both chicks survived. Within the first few days one will just disappear--who knows why?

Coyote Lake is well-named. This year our loons tried twice to nest, but each time a coyote raided the nest, destroying the eggs. Watching it happen from across the lake was painful for us, helpless as we were to intervene. We are almost certain that one of the loons was killed during the second raid, which we didn't observe, as only one loon stayed on our lake for the rest of the summer. It was a great loss but we are planning to install artificial nesting islands offshore next spring--we hope that once more there will be loons nesting on Coyote Lake.

Reprinted from: Canadian Lakes Loon Survey Newsletter, 1992(10)6.

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Possible Saw-whet Owl Nesting Records for Empress and Bindloss

Michael D. O'Shea

On March 3, 1992, a local rancher (Owen Fieldberg) reported that he had been hearing a monotonous, repetitive beeping sound outside of his house for the last couple of nights. He said that it beeped all night long and from just outside of his window. He wondered if it might be some kind of bird.

Having seen and heard Saw-whet Owls in the mountains, I suspected that it might be a Saw-whet owl, so I brought a tape recorder and a tape of owl calls (Alberta Bird Atlas Project, Owls, Prov. Museum of Alberta) out to his ranch that evening. We went outside of the house but the owl was not calling. I played a recording of a Saw-whet Owl. Immediately, we heard an owl answer in the distance. As we continued to play the recording, the owl answered from different places around us. At one point, we heard the owl calling from a group of large spruce trees immediately beside the house not far from us. Using flashlights, we were able to observe it for several minutes from 15 feet away. Both Owen and I were able to see its features clearly. Satisfied with our identification, we decided to stop disturbing the bird with the tape recorder.

I did not return to the ranch after this, not wishing to disturb the owl in any way. I asked the Fieldbergs to listen for the owl and note any changes in its behaviour. The owl continued to call each evening for about one week. After this it stopped calling and was not heard again.

The Fieldberg ranch is located on the banks of the South Saskatchewan River 9-10 km (5-6 miles) south of the town of Empress, Alberta. The river has cut deeply into the prairie valley. The buildings are situated at the bottom of some large coulees. Trees are not common in the immediate area or along the river. A number of springs run down coulees on both sides of the ranch and one contains a poplar grove large enough to support a beaver family well up above the river itself. There are no large trees in the ranch yard except for the spruce trees. There is the occasional very old and large willow growing along the river. Trees are completely absent on the other side of the river.

I have only observed one other Saw-whet Owl in this area. On June 17, 1991, I observed a single Saw-whet Owl sitting in the trees in my back yard in the town of Bindloss. It was almost dark but I was able to see its features clearly enough to identify it. It is unlikely that it was breeding in town but suitable breeding sites are located about one mile away along the Red Deer River.

In the recently published "The Atlas of Breeding Birds of Alberta" (1992), only a single *possible* nesting record is recorded for the grassland region. The authors note that only three historical breeding records exist in the grasslands region contrary to the range described by Salt and Salt (1976) in "The Birds of Alberta".

If this is true, then the Empress and Bindloss records need to be recognized as *probable* and *possible* breeding records. Both the Red Deer and South Saskatchewan River valleys contain patches of large, mature cottonwood forests suitable for nesting. Perhaps Saw-whet Owls are nesting more commonly along the river systems in the grasslands region than we presently realize.

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Authors' Address:
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For The Birds

Sherry Kozak

"To be a birder for a film series was an entirely different experience from any other kind of naturalist work I had done. It was high-pressure guiding." That's the experience of Don Enright, a naturalist guide working for 10 years in Kananaskis country, and a birder of 20 years.

Don was hired as a birdspotter to work on "For The Birds", a three part documentary series on migratory birds and habitat protection. Finding enough birds on film to fill three half-hour programs proved to be challenging.

Filming occurred in 1992 at Point Pelee National Park, Cold Lake Provincial Park, Beaverhill Lake in Canada and Monteverde Cloud Forest Preserve and National Parks in Costa Rica. The rest the production crew included director Sherry Kozak, sound recordist Clancy Livingston, and a variety of cameramen and birdspotters.

This was not a case of wandering in the woods, waiting to see what turns up. "Guiding for a bird film meant throwing our gear on our backs and hiking into the woods. Then we HAD to find birds and we HAD to know what they were doing and where they were RIGHT NOW."

It doesn't help that the crew was trying to film warblers. Birds that were very difficult to film when singing on spring territory became impossible to catch on celluloid during the summer and fall in northern Alberta, and on their wintering territory in Costa Rica.

It was easier once the crew got a system where director Sherry Kozak, Don and the cameramen were all speaking the same language to describe where the birds were on the trees.

"It was very exciting, and improved my birding skills. Now I can describe in three seconds flat exactly where a bird is and where it's moving in relation to its environment. Third tree to the left, the one that looks like a finger, go to where the ring would be....oh, it's gone."

The speed of the birding and the variety of environments were different than the usual style of birding. Going into unfamiliar terrains sometimes meant spotting birds where they weren't expected. Warblers found in the tops of spruce in Alberta were now found in deciduous trees at different elevations.

To assist with identification of secret spots where our warblers could be found, the production hired a local birder, Gary Diller, to help in the Monteverde Cloud Forest Reserve, Costa Rica. An excellent birder with a great sense of humour, Gary had reservations about Don's tropical birding credentials until the day Don spotted a Euphonia. Gary then accepted Don as a fellow birder, and they began swapping birding secrets and comparing notes for the rest of the filming.

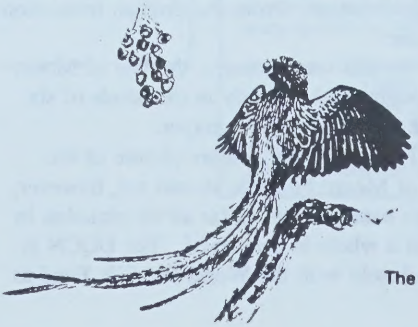
Don's favourite bird spotted over the nine months was the Resplendent Quetzal. "It's so cliche. It's the bird everyone wants to see (in Costa Rica). When you see it on the postcards, you think, it can't possibly look like that. It has to be hype, but it's not. It's the most beautiful bird I've ever seen.

Don's favourite location? "Costa Rica was an exotic, beautiful location. But, for a birding experience, I was not expecting Point Pelee to be quite as exciting as it was. The intensity of the birds there - everywhere you go, there are hundreds and hundreds of birds dripping off the trees. And also there are hundreds and hundreds of birders. I'm quite accustomed to being the only one for miles around to be jumping up and down about birds. To be able to run up to other people, and ask them what they've seen, and have them be as excited as I am is very rewarding."

It was a style of birding Don never suspected could exist,. High pressure birding. It's something Don says everyone should experience.

You can watch "For The Birds" this fall on ACCESS Network.

Author's Address:
455 - 12 Street, N.W., Calgary, Alberta T2N 1Y9.



The Quetzal

21st Annual Canadian Nature Federation Conference

Don Stiles

Aug, 14, 15 and 16, 1992 at Quebec City, organized by the Union Quebecoise pour la Conservation de la Nature (Equivalent to the Federation of Alberta Naturalists).

This was a complete conference, with something for everyone. The papers, banquet, and Annual General Meeting were held in the Loew's Concorde, a hotel on the edge of the Plains of Abraham. Activities included:

1. Field trips before and after the conference.
2. Early morning bird walks.
3. Two days of papers, covering all ecozones of Quebec.
4. Social events - A banquet, a luncheon at the Chateau Frontenac, and a Mechoui; a feast of spit roasted lamb, pork and beef, held in the typically Quebec setting of a sugar shack.
5. The Annual General Meeting of the CNF.

Each of the papers dealt, for the most part, with a specific ecoregion of Quebec. All were covered, including the Gaspe, the Magdalens, the St. Lawrence, the Saguenay, the Ottawa and Abitibi regions, and the North. There was a panel on the James Bay region, including a scientist, a Hydro-Quebec spokesman, and someone from a group who spoke against megaprojects, thus giving all sides a say. Unfortunately, the one hour allotted was not sufficient to deal with this topic in depth.

The paper I remembered most was on a specific topic - "Mont Pinacle: Tourism versus Environmental Development". This described efforts of the UQCN to save the last undeveloped mountain in southern Quebec near the Vermont border from a proposed ski and housing development. The future appears to lie in the hands of local government. From the English translation of the paper:

"At this very moment, the fate of Mount Pinnacle seems to be plainly in the hands of six municipal councillors and a mayor.

This somewhat sombre picture of the situation of Mount Pinnacle should not, however, discourage nature lovers as far as the situation in Quebec as a whole is concerned. The UQCN is working closely with the World Wildlife Fund to sensitize the federal and provincial authorities to the urgency of ensuring the adequate protection of all the natural regions of Quebec before the year 2000".

All speakers except one gave their papers in French, with simultaneous translation into English for those of us who weren't conversant with French, and vice versa. French would be the first language for most speakers, although many were fully bilingual. The speaker for the Ottawa (Outaouias) region appended a brief note in English at the end of his talk for those who resided outside of Quebec.

1. "The environmental situation is no worse than in the rest of Canada," and
2. "There are lots of people in Quebec who see the problems, but they are not in power. These people will still be here regardless of who is in power."

The translators must have found it difficult at times, especially when they found a few Latin words thrown in. I learned the first law of simultaneous translation from my table mate at the banquet, who had done some of this, "Never stop in mid-sentence. Say something that makes sense and press on". As an example, I recalled one translator saying, "Gee, this guy is going fast. I will try to catch up in a minute."

An all day field trip to Cap Tourmente east of Quebec City along the St. Lawrence River showed us the marshy area where thousands of Snow Geese rest over in the spring and fall migrations, along with a visitor centre which documents this phenomenon. A two hour bird walk in the general vicinity yielded 24 species, including a nesting pair of Peregrine Falcons, whose nest with late young was about one km away on a cliff. The return trip gave stops at the shrine of Ste. Anne de Beaupre, and at an old mill where the history of the St. Lawrence was brought alive, showing the types of houses and farm buildings used over the years. Each farm was a strip of land with a river front. There was also a luncheon stop at an inn above the famous Montmorency Falls, with a walk both above and below the falls.

Highlights of the Annual General Meeting: - Paul Griss, CNF executive director for the last six years, is leaving as of Sept. 30.

Advertisements to hire his replacement were already in place.

The Nature Canada Bookstore was to close on Sept. 30, also. It had been in a loss position for the last five years. There will still be some merchandise sold such as calendars and Christmas cards. Birdquest, the popular program with a video to teach birdwatching will still be handled. However, it was felt that the action of closing the bookstore will allow more time and opportunities to put CNF's efforts into advocacy and education for the environment in such areas as biodiversity and endangered species.

A resolution was passed supporting the expansion of the Fundy National Park by 270 sq. km, by acquiring a property to double its size. This will result in a larger wilderness-sized ecosystem complex. This is a unique opportunity as New Brunswick has only two other large protected areas: Mt. Carleton Prov. Park and Kouchibouguac Natl. Park.

Author's Address:
20 Lake Wapta Rise, S.E., Calgary, Alberta T2J 2M9.

"MOVING FORWARD TO NATURE: SUSTAINABLE LANDSCAPES"
ALBERTA WILDERNESS ASSOCIATION ANNUAL CONFERENCE

Friday, May 14 to Sunday, May 16
McArthur Place, Lac la Biche, Alberta

Two hours northeast of Edmonton in Lakeland - the site of Alberta's newest provincial park and in the heart of the boreal forest.

Friday evening: "Singing in the Rainforest" - first screening of this documentary film on song birds of the boreal forest, a large part of which was filmed in Lakeland. **Saturday morning**: Dr. Peter Murphy speaking on forests and forestry in Alberta over the past 100 years; Dr. William Reese addressing whether biodiversity and economic development are compatible; a presentation on the role of protected spaces in achieving sustainable landscapes. **Saturday afternoon**: Panel discussion "Boardrooms, barristers or blockades? - Achieving our environmental agenda". At the banquet **Saturday evening** we will hear **Herb Hammond**, renown forest ecologist and author of "Seeing the forest among the trees". **Sunday** is allocated for field trips (hiking, canoeing, birdwatching) in Lakeland.

FOR REGISTRATION INFORMATION: Alberta Wilderness Association
Box 6398 Station D
Calgary, AB T2P 2E1

or call: 439-0648 in Edmonton
283-2025 in Calgary

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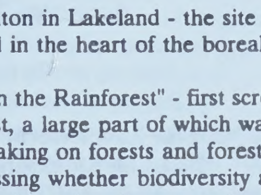

Protecting The Environment Through Private Conservancy Real Life Success

[1] Carol Smith and [2] Arlene Kwasniak

Introduction

Private landowners, Kathy and Locke Girvan, recently realized their desire to protect from development in perpetuity a portion of their land in Strathcona County. Through ConservACTION, a three year land conservation program involving Alberta Forestry, Lands and Wildlife, Fish & Wildlife Division, Strathcona County, Environment Canada and Sherwood Park Fish & Game Association, and with some assistance from the Environmental Law Centre, the Girvans and the Provincial Crown, as represented by the Minister of Forestry, Lands and Wildlife, placed restrictive covenants on title to the Girvan's 64 acre (2.56 Hectares) plot of land bordering Antler Lake, 17 kilometres east of Sherwood Park. The effect of the restrictive covenants is to protect a 200 m strip of wildlife and waterfowl habitat along the shoreline. Two remarkable aspects of this achievement are that they accomplished it using the cumbersome common law rules regarding restrictive covenants, and that the Alberta Planning Board agreed to subdivision without the dedication of a lakeshore environmental reserve.

The Common Law Restrictive Covenants

Valid restrictive covenants at common law require two parcels of land, one constituting the servient tenement and one the dominant tenement. The dominant and servient tenements must be owned and occupied by different person. As well, the restrictions placed on the servient tenement must be negative in nature and must benefit the dominant tenement.

In the Girvan case, the Common Law requirements have been met in a unique and innovative manner. The servient lands are an identified portion of the lands described on title. The lands constituting the dominant tenement are the beds and shores of Antler Lake. The Crown, as owner of beds and shores of permanent lakes pursuant to the Public Lands Act holds the dominant tenement. The agreement describes the benefits conferred by the servient tenement to the dominant tenement primarily in terms of benefits to the wildlife and water fowl and their habitat on the dominant tenement. The restrictive covenants have been registered again title at the Alberta Land Titles Office.

Subdivision Approval

When they purchased the property four years ago, the Girvan's planned to subdivide the 64 acre parcel, sell half and use the proceeds to build a new home on the other. At the first instance, the County denied their application for subdivision. On appeal, the Alberta Planning Board approved the subdivision subject to their agreeing to dedicate an environmental reserve of 40 m along the shore, in accordance with s.98 of the Planning Act. However, after the restrictive covenants were in place, the Girvan's reapplied for subdivision approval. Although the County again refused their application, on appeal, the Girvans satisfied the Alberta Planning Board that the restrictive covenants would adequately protect the natural habitat, and the Board waived the requirement for an environmental reserve.

The Need for Law Reform

Based on our experience, it is clear that a considerable number of Alberta private landowners would like to preserve in perpetuity a portion of their land for conservation purposes. Unfortunately, neither the cumbersome common law rules nor the limited statutory tools available have facilitated their objectives. The Environmental Law Centre, in advancing its law reform objective, has urged the Provincial government to enact legislation to facilitate private landowners private conservancy objectives. The Girvan case is an exception. The Centre congratulates ConservACTION, the Provincial Crown and mostly, the Girvans, on their persistence in achieving private conservancy objectives with the limited tools available.

"Legal Mechanisms For Private Conservancy in Alberta: A Law Reform Proposal" 1991, available from the Environmental Law Centre.

ConservACTION's Use of Restrictive Covenants as a Tool for Private Conservancy

Introduction

The pressures on Strathcona County's limited land resource result in decreases to remaining wildlife[1] habitat. These pressures are increasing due to demands for housing and associated social services, transportation, recreation, agriculture and economic development. In order for the County to find a balance between human development and wildlife habitat protection, it must plan to conserve for, rather than against, appropriate development.

With 90% of the land in Strathcona County privately owned, the goal of wildlife habitat protection must be implemented by negotiating broad, comprehensive conservancy agreements with private landowners. The aim is to ensure that the continuation of healthy, functioning ecological systems[2] are protected and managed in perpetuity. This guarantees wildlife the habitat they require, but also ensures the County's continued environmental and social health, and economic stability.

One Tool for Private Conservancy

ConservAction pursued the restrictive covenant as one tool that allows protection of wildlife habitat on private land in perpetuity. It encourages the landowner to accept restrictions on the way a portion of the land is used. At the same time, the owner continues to use the remainder of the property for residential, farming or recreational use. This results in integrating wildlife habitat protection while continuing to allow the land to be used in traditionally productive ways.

There are several advantages in acquiring covenants versus outright acquisition in order to foster wildlife habitat conservation on private property. Firstly, the cost of a covenant will usually be lower than the cost of acquisition because a lesser interest in property is being purchased. Secondly, the property remains on the municipal tax rolls. Thirdly, management of the land remains with the private landowner therefore any outside interference with the property is quickly detected and dealt with. On final advantage of the restrictive covenant is its flexibility. The document can be custom made to suit the idiosyncrasies of any property and its owner.

The Common Law Restrictive Covenant

However, there are strict requirements to meet before a common law restrictive covenant can be entered into. These are: that the covenant must be negative; the various parcels of land serve as dominant and servient tenements; and the covenant touches and concerns the land. Thus far, it appears that these conditions can be met in our case, by entering into a common law restrictive covenant with the Minister of Alberta Forestry, Lands and Wildlife, a partner in the Sherwood Park Fish and Game ConservACTION Program.

The covenant will be negative by allowing no development on the servient tenement. The dominant tenement will be the Crown land known as Antler Lake (agreements exist utilizing an unpatented piece of Crown land, a lake, as the dominant tenement). The servient tenement, a proposed 40 m buffer along the shoreline (approximately 17 acres), is burdened by the covenant; and the dominant tenement, Antler Lake, gains the benefit of the covenant. The restrictive covenant does touch and concern the land.

Time and Cost

The entire procedure, to register the common law restrictive covenant, obtain legal subdivision of the parcel with the restrictive covenants in place, and successfully sell the second half of the subdivided parcel with a restrictive covenant registered on title, took an entire year to complete. The price tag to protect these 17 acres of wildlife habitat on the shores of Antler Lake totalled just under $20,000.00. These costs include:

1. The amount of the income tax receipt issued to the Girvans for their donation of the Crown of a portion of their bundle of rights over the property;

2. A professional appraisal to determine the fair market value of the property before and after the restrictive covenant was registered;

---

[1] The term wildlife is defined to include algae, bacteria, plants, fungi, invertebrates (insects, etc.), fishes, reptiles and amphibians, not just the birds and mammals traditionally thought of as wildlife.

[2] Ecological System: Often shortened to "ecosystem" is a system of interrelated organisms and their physical chemical environment.

3. ConservACTION and Alberta Fish & Wildlife staff time;
4. Professional legal advice, of which a large portion was donated by the Environmental Law Centre, and;
5. A written opinion from Revenue Canada, via the accounting firm of Price Waterhouse, to determine if the income tax receipt was legitimate.

Conclusion

In retrospect, the Girvans achieved their wish to protect a portion of their property in perpetuity, Strathcona County registered their full support before the Alberta Planning Board to allow the restrictive covenant to replace an environmental reserve normally requested under the Planning Act and a piece of property was purchased in Alberta with a common law restrictive covenant registered against title to protect wildlife habitat in perpetuity. Recognise the fact that the two covenants currently being negotiated under the ConservACTION Program will cost a great deal less to complete.

Nonetheless, as a tool to be used for private conservancy the common law restrictive covenant is a costly and time consuming endeavour to undertake. Therefore, the program is wholeheartedly encouraging the pursuit of law reform to allow a mechanism to be established that makes it a great deal easier for private landowners and environmental organizations to conserve wildlife habitat on their property in Alberta in perpetuity.

The concentration of people and the economic lifestyle we pursue in North America causes serious conflicts over the proper use of our limited land resource. By utilizing a variety of techniques to conserve wildlife habitat on private property, preservation of vital ecological systems can be realised. Individual efforts, similar to landowners like the Girvans, will contribute to a diverse landscape of economically viable lands, linked with protected natural areas.

Nevertheless, we need more effective tools and legislation to undertake these steps. **How can you help?** Write to your Provincial government to enact legislation to facilitate private landowners private conservancy objectives. If interested in more information contact Carol Smith, ConservACTION Coordinator, at 922-2736, Arlene Kwasniak, Solicitor, Environmental Law Centre or Wildlife Habitat Canada at (613) 722-3318 for their publication *Land, Law and Wildlife Conservation - The Role and Use of Conservation Easements and Covenants in Canada.*

Authors' Address:
[1] ConservACTION, Range Road 212, Ardrossan, Alberta T0B 0E0.
[2] Environment Law Centre, 201, 10350 - 124 Street, Edmonton, Alberta T5N 3V9.

Letter to the Editor - the Bluejays Have Come Back to Morrin

To Whom It May Concern:

I was unable to take part in the Alberta Bird Atlas Project, but felt I should drop you a line. Being farmers and gardeners, our family has fed many kinds of birds all year round.

We had not seen a Bluejay since 1909 at our farm in Morrin, Alberta, which is north of Drumheller. In the fall and winter of 1973 we had our first Bluejay sighting in almost 70 years. We fed sunflower seeds to the Bluejays in our yard that year, and they are becoming more and more common lately.

Since 1973 there has been a remarkable increase in Bluejays across our whole area. We ourselves feed 8-12 of them each season from September or October until April (and thereafter sometimes, at feeders). We even plant extra corn and sunflowers for the "Jays", we bring in half a barrel of dried corn cobs for them in the fall, and we buy large bags of sunflower seed to feed our "brood". For the past two years, one pair has remained long after the rest have left.

An unusual event this spring was the sighting of a Mockingbird by four of us on May 23rd, 1992. I have rarely been treated to the sight of this lovely bird, and was once treated to its delightful and amazing songs.

I have kept records of bird sightings since 1972. We have many trees and berry bushes, and lots of spruce trees on our property. Thank you all for all of your work.

Yours truly,
Mrs. Clara Montgomery,
Box 157, Morrin, Alberta T0J 2B0.

Announcements

Egg Island Established as Ecological Reserve

Edmonton - Egg Island, located within Lake Athabasca about 50 km northeast of Fort Chipewyan, was approved by Order-in-Council on October 15, 1992 as Alberta's 14th ecological reserve. The establishment of Egg Island was officially acknowledged along with six new natural areas at a Tri-Council meeting of Federal/Provincial Ministers of Parks, Fish and Wildlife and Environment in Aylmer, Quebec on November 25, 1992.

Egg Island, approximately 0.6 acres in size, is designated as a "special ecological reserve" as it contains the only known nesting site in Alberta of the rare Caspian tern, a colonial nesting species. It is believed that Caspian terns have nested on this island since the turn of the century. The National Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists the Caspian tern as a rare species. In addition to California gulls which also nest on the island, and Arctic terns and Parasitic jaegers are other bird species that can be observed in the area.

Ecological reserves are areas selected for their natural values and contain "special" or "unique" examples of Alberta's natural, biological and physical features or representative examples of Alberta's natural landscapes. The purpose of ecological reserves is to conserve and protect those features and landscapes for research, education and heritage appreciation.

Public input regarding the ecological reserve designation was solicited at a public meeting held at Fort Chipewyan in September, 1990. Interested members of the community were in attendance as well as representatives from government agencies and the Canadian Coast Guard.

For more information on Egg Island or Alberta's other thirteen ecological reserves, contact Wayne Nordstrom, Ecological Reserves Planner, Alberta Parks Service at (403)427-6781 in Edmonton.

* * * * * * * * * *

The Birds Need Boundary Bay........ ....And We Need You!

Dear Supporter:

You, and the groups you support, have been identified as caring, responsible advocates of resource protection. You have written letters, donated time, and given money. Your ongoing contributions are effecting a gradual change, a new ethic, amongst people and politicians.

The change is gradual and the means are difficult. However, it is the unrelenting support of people like you that is initiating and generating action for more long-term, responsible planning and conservation.

The Boundary Bay Conservation Committee asks you to add yet another contribution. We need money to pay the costs of two court cases we are fighting to protect the birds of Boundary Bay:

*** The best wintering raptor habitat in Canada, adjacent to the dyke on Boundary Bay, is being dug up for development of the Boundary Shores Golf Course.**

*** Northern Pintail habitat in the Serpentine floodplain is being destroyed for the Northview Golf Course.**

The Boundary Bay Conservation Committee won the original Boundary Shores B.C. court case against the Municipality of Delta, but this was successfully appealed by the proponents in a controversial 2-1 split.

The Northview court case is being fought with c-plaintiffs, the Western Canada Wilderness Committee, against Surrey Municipality. Our legal counsel is Greg McDade of the Sierra Legal Defence Fund. Although we were unsuccessful in the B.C. Supreme Court, we have filed an appeal.

We are now appealing to you: Please help us protect the Boundary Bay ecosystem by funding these court cases.

Your support is appreciated by the members of the Boundary Bay Conservation Committee along with 1.5 million waterfowl and shorebirds, as well as the largest number of wintering raptors in Canada. Thank You.

Cheques should be made payable to : Boundary Bay Conservation Committee Legal Fund, Box 1251, Station A, Delta, B.C. V4M 3T3, Phone: (604)943-6406.

* * * * * * * * * *

From Desert Sands to Alpine Slopes

22nd Canadian Nature Federation Annual Conference, Vernon, B.C. on July 22, 23, 24 and 25, 1993.

Hosted by the North Okanagan Naturalists' Club...Celebrating their 42nd Anniversary.

Explore the famous Okanagan Valley, from the desert in the south to the alpine slopes in the north--join us at western Canada's well-known Silver Star Mountain Resort, *a Canadian Classic!*

The Conference Calendar includes pre and post Conference field trips, as well as day trips, local birding and botany walks, symposiums, exhibits, a barbecue, a banquet, and children's activities--so bring the whole family.

Don't miss this chance to experience summer in the Okanagan Valley!

* * * * * * * * * *

Field Assistants And Interns needed at Beaverhill Bird Observatory, near Edmonton, Alberta to monitor songbird migration, band and process birds and conduct breeding bird censuses in six grazed and ungrazed habitats in aspen parkland ecoregion. Field accommodation is primitive but free. Assistants will also receive $1,000 to $1,500/month. Paid positions are contingent on funding and some citizenship restrictions. Send resume and phone number of three (3) references to Geoffrey L. Holroyd, Beaverhill Bird Observatory, Box 1418, Edmonton, Alberta T5J 2N5 or FAX (403)495-2615.

* * * * * * * * * *

Book Review

Plants of Northern British Columbia
Best field guide of '92!
Editors: A. MacKinnon, K. Pojar, R. Coupe. 1992. BC Ministry of Forests and Lone Pine Publishing. 352 pp. $20.

This book is a must for every Alberta naturalist! Congratulations to all ten authors involved. What a great way to do a plant field guide: - involve many specialists from different fields of botany, plus local naturalists who know the area in question!

A big advantage of this guide is the diversity of plant groups presented. Sections include: trees; shrubs; wildflowers by family; grasses, sedges and rushes; ferns; horsetails; clubmosses; mosses and lichens. Twenty-one excellent keys are provided to assist in identification of confusing groups such as willows, *Ribes* (currants and gooseberries), and grasses. The photographs are very good, with supplementary sketches to add details of flower or leaf. To show the size of the plant, a squirrel or moose sketch occasionally provides scale.

Plant descriptions are detailed, including abundant tips on similar species, use of plants by native groups, and derivations of both scientific and common names.

The book is a handy size for the field, with rounded page corners providing ease of handling. The reference list is extensive. One possible improvement would be to add more common names, as they contain much local cultural information. I did not have the opportunity to "test drive" this guide in B.C., but found it very useful for the boreal area of western Alberta. Chris Czajkowski, a wilderness guide living in Nimpo Lake, B.C., reviewed this book for the fall 1992 issue of "Wildflower" (Canadian Wildflower Society). He calls the book "superb, for the high dry plateau county of north and central B.C.".

Now we need a "Plants of Northern Alberta" in the same format, to include our Canadian Shield treasures from the NE corner of the province (eg: stemless lady's slipper, *Cypripedium acaule*). Will prospective authors please step forward?

Reviewed by: Elisabeth Beaubien, (President ANPC; coordinator Alberta Wildflower Phenology Survey, Devonian Botanic Garden, University of Alberta, Edmonton T6E 2E1).

SUBMISSION GUIDELINES

GENERAL GUIDELINES

The Alberta Naturalist is published March 1, June 1, September 1, and December 1. The deadline for contributions is 6 weeks prior to the publication date.

1. Manuscripts must be typed, double spaced on 81/2" by 11" paper, or submitted on diskette (IBM compatible). Mail: FAN, Box 1472, Edm., AB T5J 2N5. Express: 11759 - Groat Rd., Edm., AB T6M 3K6. Fax: 453-8553. Phone: 453-8629.

2. One or more photos, illustrations, or slides should accompany your article. Also include captions and credits.

3. High quality maps and short tables are welcome.

4. Footnotes and a bibliography should include author, title, place of publication, publisher, date, and page reference or pages.

5. Manuscripts should contain a minimum of scientific jargon; they should be understandable by the general public.

6. Site locations should be described in reference to communities on the Alberta Road Map.

7. Articles not previously published are preferred.

8. The editor reserves the right to edit for length, grammar, accepted nomenclature, and readability.

9. Manuscripts may be sent out for peer review.

10. All articles must be accompanied by the author's address.

SPECIFIC GUIDELINES

1. Letters to the Editor:
   - up to 500 words

2. Comment Column:
   - up to 500 words
   - should be topical; may include personal observations or reactions to an article in the AN, a current issue, government or private action, FAN, policy, etc.

*3. Issues Column:
   - 1000 to 2000 words
   - current issue, preferably in Alberta
   - query editor in advance

*4. Feature Articles:
   - 1000 to 2000 words
   - may deal with personal observation of natural phenomena, report on a trip, profile of a facility, park, area, or activity, concerns of membership, etc.

*5. Research/Report Articles:
   - up to 2000 words
   - should include where research was undertaken, purpose, sponsor, research methodology, and summary of findings with emphasis on the latter

6. Technical Articles:
   - 500 to 1000 words
   - "how to" articles of interest to naturalists
   - could include identification, photography, minimum impact "naturalizing", etc.

7. General News:
   - 100 to 300 words
   - interesting personal observations, unusual sightings, upcoming events not sponsored by member clubs, etc.

*8. Profile Articles:
   - 1000 to 2000 words
   - profiles of notable Alberta naturalists

9. Club News:
   - 500 to 750 words

10. Book Reviews:
   - 500 to 750 words
   - must include publication data, price, short synopsis of the book, strengths and weaknesses

11. Conference Review:
   - 500 to 750 words
   - must be published within six months of the event

*Exceptions to these guidelines may be made in consultation with the editor.

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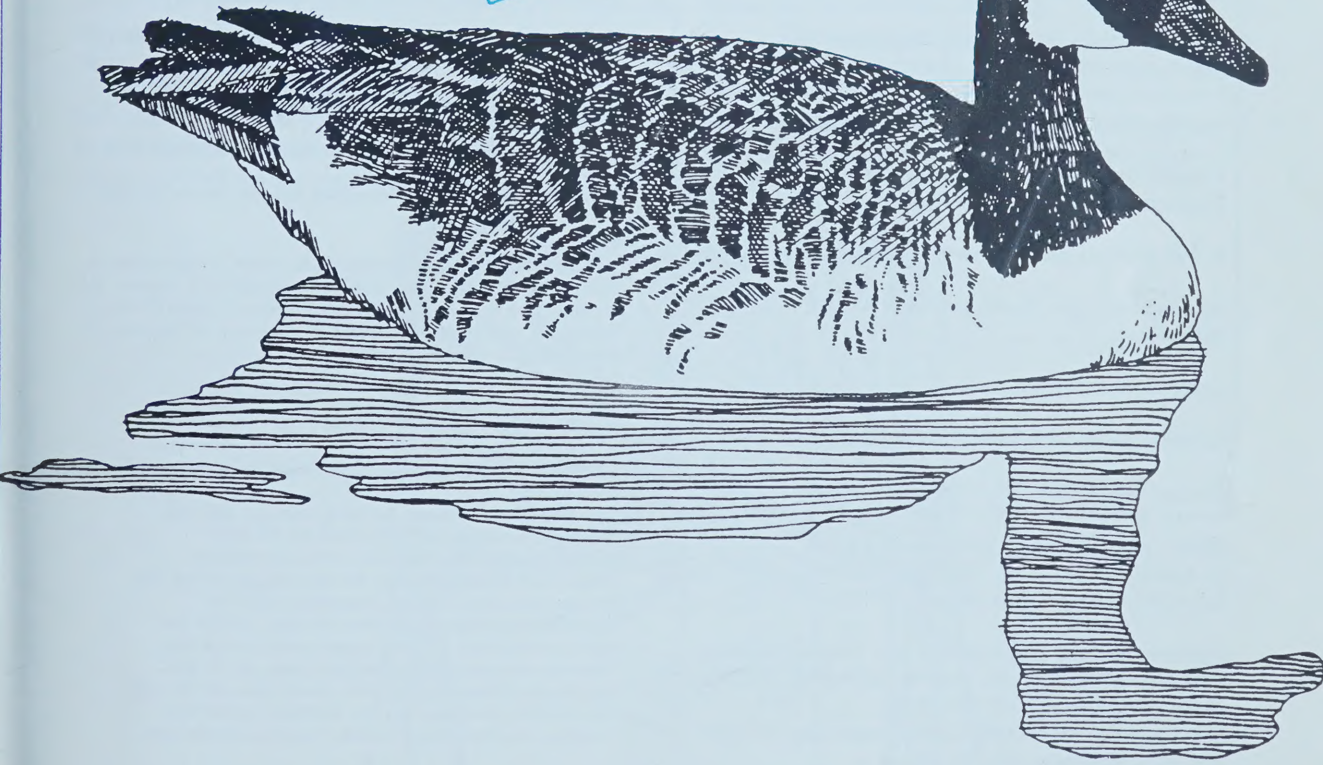

**Bird Atlas Wins Award - Snowmobiles on Ministik Lake - Watchable Wildlife Project
Swift Fox Comeback - The Song Finder - Window Kills - Whoopers
Rare and Very Rare Alberta Breeding Birds - Footner Lake Forest River Inventories**

ALBERTA NATURALIST

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CONTENTS

President's Page 1

From the Editor, Emerald Awards, ABA Update 2

Nest Platform for Great Gray Owls in Alberta, Douglas M. Collister 3

Ecological Impacts of Snowmobiles on the Ministik Lake, Kevin Timoney 5

Alberta's Watchable Wildlife Checklist Series Project, Chel Macdonald and Pat McIsaac 9

Swift Fox Comeback in Canada, Ludwig N. Carbyn 11

Moose Colonization of Treeless, Shortgrass Plains, Bob Gainer 12

The SongFinder, Cam Finlay 14

A Ruffed Grouse's Last Meal, Geoff Holroyd, Elisabeth Beaubien & Michael Holroyd 15

Hurrah for Whoopers!, Theresa Aniskowicz 17

Rare and Very Rare Breeding Birds of Alberta, Don Stiles 18

Letter to the Editor 19

Canadian Lakes Loon Survey, Harry Vogel 20

Footner Lake Forest - River Inventories 21

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, FAN, Box 1472, Edmonton, AB T5J 2N5.
May Species Count-Plants; July 15, J. Derek Johnson, Northern Forestry Centre, 5420 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Patron: Hon. Dr. J.W. Grant MacEwan

The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research, and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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Earth Care Peace Study Centre

President's Page

R Barry Jenkins

The sun is shining in a clear blue sky, a robin is singing it s heart out in a tree in my back yard and I am sitting at a computer writing the President's Page for an Alberta Naturalist. This is yet again a lesson about procrastination, one that I keep getting but never seem to learn.

The FAN directors held a meeting in Lac La Biche during the May long weekend. We try to move our meetings around the province to help us keep in touch with the province as a whole. It is always a problem trying to keep from being dominated by Edmonton's and Calgary's interests and problems. We are an Alberta wide organization and although the majority of the people live in these two cities the focus for our member groups and individuals is often located outside of the cities. By moving our directors around the province (we have held meetings from High Level to the Cyprus Hills) it keeps us aware of the incredible diversity of the province. Hopefully this helps us out of our local ruts so we can concentrate more on the province as a whole.

Special Places 2000, the draft policy statement on the expansion of protection of Crown Land, is proceeding as well as can be expected. As we are dealing with a provincial civil service in almost total chaos from department moves, reorganizations, position abolishments and cutbacks and as the government itself is concentrating on an election it is almost amazing that there is anything being done at all. What is being done is more study (of course). There have been a numer of public meetings and focus groups (with invited stakeholders) to attempt to gather more feedback on the implementation of and priorities for the expansion of protection in the province. The idea is to do a fairly quick survey of opinions and ideas followed immediately with the implementation of the policy using the results of this springs study to form the basis for the priorities and implementation procedures. All three main parties have apparently agreed in principle to the idea of expanding protected areas but with an election on what else they say to "environmental" groups. What is said during the election to the current holders of agricultural leases and FMAS, of the potential protected areas, may be somewhat different.

For the summer try to ignore what is immediate and do what is important. Let the lawn grow another day, so get out and enjoy nature, the lawn will be there to mow tomorrow, but today is only here today. *Enjoy it.* It looks like I still have not learned my lesson doesn't it?

From the Editor

Just a reminder that we need your submissions. Alberta Naturalist relies on members for the articles we run. In order for our publication to maintain the high standards of past issues, we need your help. Send your articles to the Federation of Alberta Naturalists, Box 1472, Edmonton, Alberta T5J 2N5.

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Horse Report Ready

The Grasslands Naturalists' submission - which includes our recommendations - to the Advisory Committee on the CFB Suffield feral horses is now finished. Anyone who wishes their own copy, or who would simply like to read it, can contact Dennis Baresco at 529-1275.

Our submission is a well researched document that objectively addresses the interaction between the horses and the ecosystems they inhabit, taking into account other factors such as fire and climate. I hope that as many members as possible take advantage of the opportunity to have a look at this highly readable report. -- D.B.

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FAN was presented with an Emerald Award by the Alberta Foundation for Environmental Excellence at its annual award ceremony in Calgary on June 7, 1993. The Federation's award was in the environmental education category, where it was cited for its outstanding commitment to preserving, protecting and enhancing our environment through its efforts in the publication of the Atlas of Breeding Birds of Alberta.

* * * * * * * * * * * * * * *

Congratulations to Edgar T. Jones who was one of seven people to receive an honourary degree at the spring convocation at the University of Alberta. Mr. Jones is a well known naturalist and wildlife photographer with 40 years of experience as a conservationist. He has 10 films to his credit and extensive television credits, and he was a co-founder of the Alberta Wildlife Foundation.

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Alberta Bird Atlas Update

The first printing of the Atlas of Breeding Birds is completely sold out and there are orders still coming in from individuals and retailers. The book is now in its second printing and should be available at the end of June.

The Bird Atlas database is presently housed at the FAN offices and there have been several requests for data that have been filled to this time. The database can be viewed as having two parts. Part one is the data itself and Part two is the Database Management System (DBMS). The data consists of 122,400 records collected over the five year project period. Each record contains a species code, abundance code, breeding code and atlasser name referenced by both year and by 10 x 10 km square. The records were placed under the scrutiny of the Records Confirmation Committee, who examined extralimital records and records of rare species. Records having insufficient or unconvincing data (on a double blind basis) were rejected by the Confirmation Committee. They were placed in a secondary file, for future access, but were not included in the data used to prepare distribution maps for the Atlas. Information is also available on the individual recording the data (hours spent, address, and telephone number). As well, information on whether a particular spcies is regarded as endangered and its full common name is available.

The DBMS data structures are the files containing the data in an efficient format to eliminate storage redundancy and to facilitate access to the data. There are programs which access these data structures to produce reports (such as species lists for squares and blocks), distribution maps and tables illustrating relationships between distribution and habitat.

The experience gained in the ABAP has provided valuable insight into changes needed to improve the existing system for greater efficiency and better error checking procedures. The DBMS was created with dBASE IV, which is a common and easily transferable format, if upgrading to a more sophisticated DBMS becomes desirable.

Nest Platforms for Great Gray Owls in Alberta

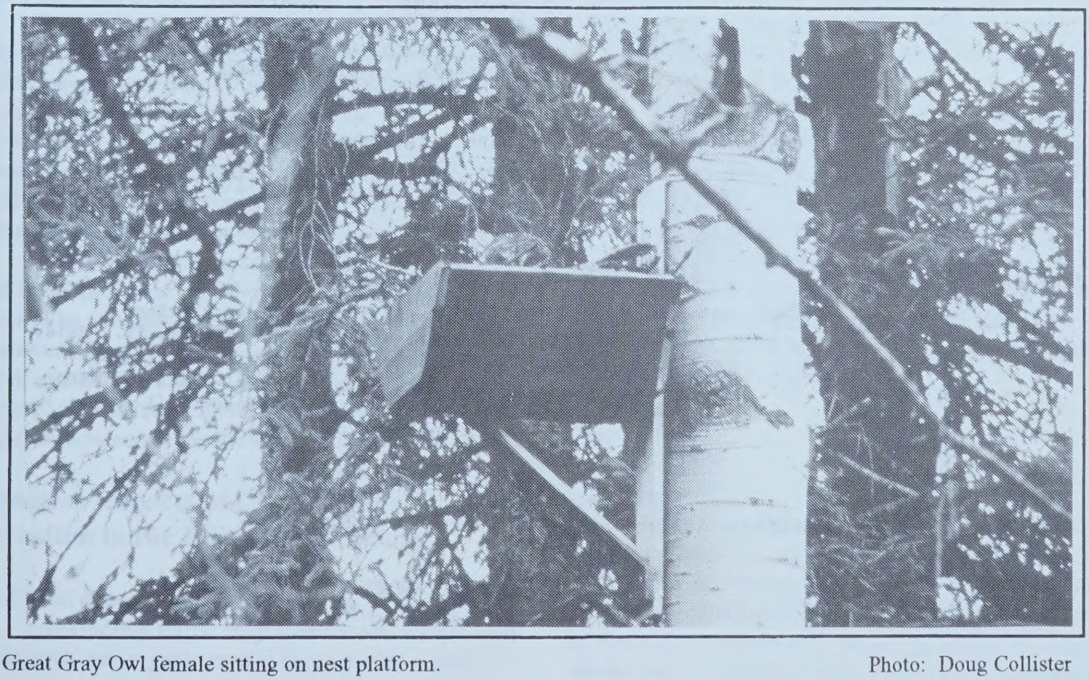
Douglas M. Collister

Great Gray Owls are known to accept artificial nest platforms. Nero (1980) described building nests for this species in tamaracks in southeastern Manitoba. In trees with appropriate space he fashioned nests using large dead sticks as a base topped with smaller branches and twigs packed down into a 45 cm diameter form. Fine sticks and twigs were crushed to form a dense lining of a fairly deep depression in the centre. For trees with insufficient branches to adequately support a nest a piece of wire screen was used as a base. Nests were placed at heights from 3 m to 9 m. From 1971 to 1974, 35 nests were constructed without a single occupancy. From 1984 to 1988, 62 artificial nests out of a possible 682 were used (9.1% occupancy) (Duncan 1988).

Beck and Smith (1987) constructed 10 nest sites in northern California during September 1984 by topping large conifers to simulate snags. Trees with an average diameter of 109 cm were cut off a height of 8.5 m to 20 m and tops were hollowed into a bowl shape with drain hole. The one site occupied by Great Gray Owls in 1985 was 11 m high in a 94 cm diameter tree. The nest diameter was 46 cm and its depth was 18 cm.

Bull *et al.* (1987) studied Great Gray Owl nest height and type preference in northeastern Oregon. Nest platforms and nest boxes were constructed and placed as part of the study. Their nest platform design is illustrated in Figure 1. From 1983 to 1986 12 platforms were occupied out of a possible 214 (5.6% occupancy) while no nest boxes were occupied. Platforms were placed at two heights - 15 m and 9 m. The owls preferred the platforms that were 15 m high and, in fact, did not nest in a 9 m platform when a 15 m platform was available. However when no higher alternative was available, owls used 9 m platforms on occasion even when a natural nest site was available nearby. More pairs of Great Gray Owls fledged young from platforms then did those pairs that nested in natural sites (83% versus 70%), apparently due to the increased stability of the platforms.

In June 1987 my wife and I acquired a piece of mixed woodland in the foothills of Alberta southwest of Water Valley. That fall, with the help of Ross Dickson, Jamey Podlubny and Clay Hunt, I placed several owl nesting structures including one Great Gray Owl platform based on the design of Bull *et al* (1987). The platform, 5.5 m up in a live poplar, was occupied by a pair of Great Gray Owls in 1991 after being vacant from 1988 to 1990. The observations made during infrequent visits to the platform are presented in Table 1. Few visits were made



Great Gray Owl female sitting on nest platform. Photo: Doug Collister in order to minimize disturbance. This platform was not re-used by Great Gray Owls in 1992.

Based on the relatively quick acceptance of our platform it may be that in some areas of Alberta, such as the foothills of the southwest, Great Gray Owls have a limited supply of quality nest sites. Nest platforms offer potential for enhancement of Great Gray Owl habitat suffering from this deficiency. The nest platform design of Bull *et al.* (1987) offers a simple yet sturdy and long-lasting structure. In 1992 I erected two additional platforms while two of my neighbours placed several platforms each on their land in hopes of providing nest sites for Great Gray Owls.

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Beck, T.W. and R.A. Smith. 1987. Nesting chronology of the great Gray Owl at an artificial nest site in the Sierra Nevada. J. Raptor Res. 21(3):116-118.

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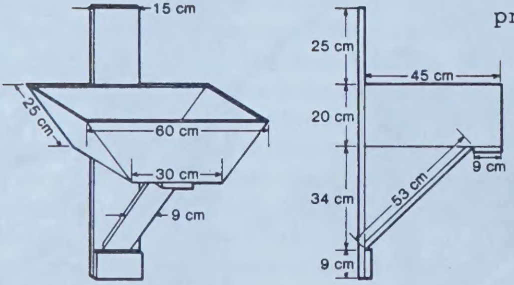
Duncan, J.R. 1988. Great Gray Owl Telemetry Study - Progress Report 1988. Biological Services, Department of Natural Resources, Winnipeg, Manitoba. 5 pp.

Nero, R.W. 1980. The Great Gray Owl - Phantom of the Northern Forest. Smithsonian Instiution Press, Washinton, D.C. pp. 138-139.

Table 1 : Nest site observations of Great Gray Owls occupying an artificial nest platform SW of Water Valley, AB during 1991

Date	Observation
Apr 28	female sitting tight, male nearby
Apr 30	3 eggs, both adults present
May 5	female sitting tight, male nearby
May 8	1 egg hatched, another pipping, both adults present
May 19	2 nestlings, 1 unhatched egg believed to be the second due to extreme size difference in nestlings, both adults present
May 30	1 young in adjacent spruce, other still in nest, 1 unhatched egg, both adults present



--Great gray owl nest platform constructed from 2-cm thick boards. Holes were drilled for 20-cm long ring-shank nails used with washers. Platforms were stained with 5 parts linseed oil and 1 part gray stain.

Figure 1. Nest platform design from Bull et al. (1987)

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Ecological Impacts of Snowmobiles on the Ministik Lake Game Bird Santuary, Central Alberta

Kevin Timoney

Intoduction

The Ministik Lake Game Bird Sanctuary comprises some 7349 ha of prime hummocky ground moraine natural landscape located approximately 24 km southeast of Edmonton, Alberta. This island-like nature of the sanctuary places its ecosystem at risk due to cross-border influences that are beyond regulatory control.

Land use practices within the sanctuary also place pressure on the ecosystem such as domestic grazing and motorized recreation. The purpose of this summary is to apprise the public of the santuary's current level of winter OHV use and its attendant ecological impacts. The report from which this summary is extracted was presented to the Ministik Lake Game Bird Sanctuary Public Advisory Committee by Ms. Carol Smith on 4 March 1992. For the sake of brevity scientific references have been deleted in this summary. Interested readers may write the author for a copy of the full report.

Ministik OHV User Survey

Data were gathered on OHV use in the Ministik Sanctuary between 19 December 1992 and 24 January 1993 at Access Point 33 (NE side of sanctuary). Observations spanned nine user days at three hours per day on weekend afternoons. Users totalled 644 people and 622 OHV's were observed.

The median number of OHV's observed during the study at Access Point 33 on weekend afternoons was 90 machines represented by 79 snowmobiles, eight quads and trikes, and two dirt bikes (Figure 2). The snomobile: wheeled OHV ratio was 9:1. It is noteworthy that decreased snow depths contributed to a large increase in wheeled vehicle use during late January 1993 such that the median snowmobile: wheeled OHV ratio fell to 2.9:1.

Based on these data, Ministik OHV use is dominated by adult males. OHV use in Ministik does not appear to be a family activity. Snowmobiles predominated over wheeled vehicles early in the observation period; quad, trike, and dirt bike use rose to approximately 25% of all recreation vehicles later in the period during shallow snow conditions.

Ecological Impacts of OHV Winter Recreation in the Ministik Sanctuary

Vegetation, Flora, and Soils

Snowmobile traffic may alter the soil temperature regime such that organic matter decomposition and humus formation are retarded, and the survival of some plants and vegetation jeopardized. Soil litter, duff, and A horizon temperatures under snowmobile-compacted snow are significantly colder and more variable in temperature than under undisturbed snow. Snow compaction may strongly reduce populations of soil bacteria, and may also lead to reductions in soil fungi.

Snowmobile-induced injury to vegetation at and above the snow surface can be severe. A single pass of a snowmobile can affect the physical environment and damage underlying plants. During a winter of light snowcover, 92.6% of white spruce contacted by snowmobiles were damaged, with 45.4% receiving heavy damage; 8% of the trees died as a result of the snowmobile damage. In willow/dwarf birch shrub fens subject to infrequent passage of snowmobiles during warden patrols in Wood Buffalo National Park (approximately four passes per winter), trails remain clearly visible the year following as a swath of bent, broken, and dead shrubs.

Wanek has documented that the shallower the snowcover, the more the damage due to snowmobiles. While precise figures are lacking, snow depths less than 25 cm appear to be insufficient to protect the underlying soil and vegetation. Snowmobile traffic can damage rare vegetation and flora, resulting in local extinction. In particular, bog vegetation has been shown to be extremely sensitive to snowmobile disturbance.

Due to deeper frost penetration under compacted snow, the spring growth of many plants is retarded. Delayed growth, reduced vitality, reduced flowering, and increased mortality have been observed in many plants. Disturbance of the soil by recreational vehicles favours the spread of non-native weeds along OHV routes. Snowmobile-induced disturbance may be a factor in the spread of non-native weeds such as sweet clovers, white clover, and Kentucky blue grass observed along trails in the Ministik Sanctuary.

Mammals

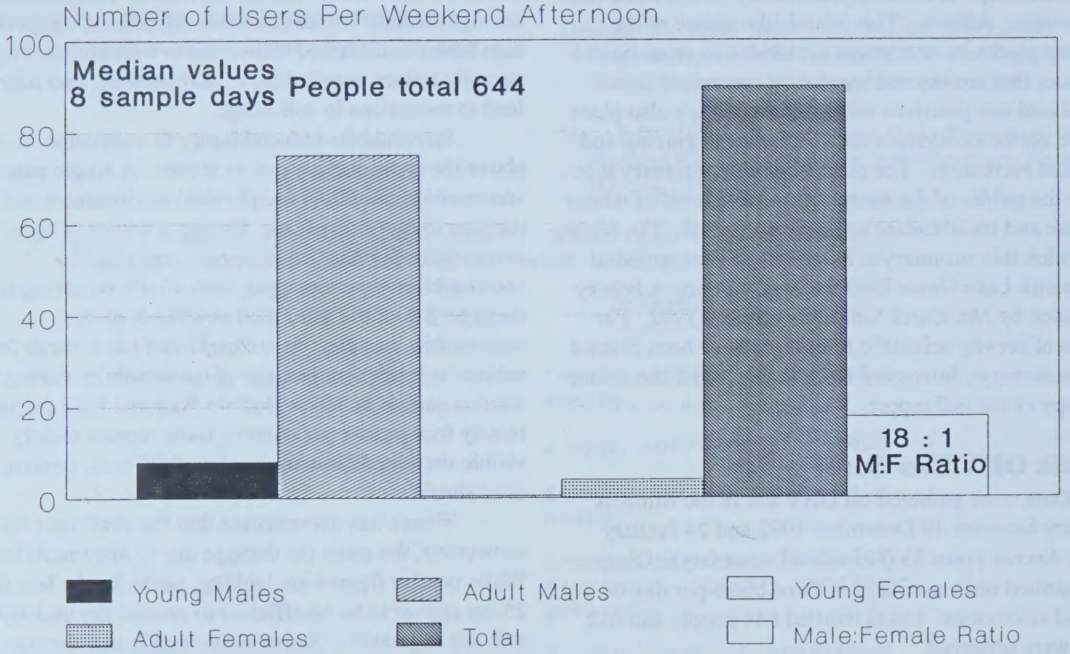
Large mammals

Most research on the effects of snowmobiles on large mammals has centered on the effects of noise and movements in creating disturbance. The most intensively studied large mammal has been the white-tailed deer *(Odocoileus virginianus)*. While the results of various studies are not entirely concordant, it may be concluded

Figure 1.

Ministik Sanctuary Winter 1993 OHV Users

Data for Access Point 33, afternoon only



that white-tailed deer seem the ungulate most tolerant of snowmobile activities.

The potential effects of persons on snowmobiles to actively chase deer and elicit flight responses requires study. In south-central Minnesota, 13% of respondent snowmobile owners had observed snowmobiles chasing wild animals during the winters of 1971-72 and 1972-73 for a total of 86 or more incidents. Eckstein *et al,* concluded "We recommend that snowmobile trails be routed away from areas where deer concentrate during the winter..."

Impacts upon humans in the vicinity of motorized recreational activities requires study. The impacts include noise pollution, trespass and vandalism, safety hazards, user conflicts of skiers, hikers, and nature lovers with motorized recreationists, loss of solitude, etc. Interviews with local residents indicate that non-motorized winter recreation in the Ministik Sanctuary is presently low because many people feel the area is overrun by snowmobiles.

Medium-Sized Mammals

Responses of medium-sized mammals to snowmobiles has been observed to vary by species, snow depth, and other factors. Various wildlife officers have noted that the introduction of snowmobiles has resulted in the decline of trapped and hunted species.

Snowshoe hares *(Lepus americanus)* appear to avoid, while red fox *(Vulpes)* appear to prefer, snowmobile trails as travel routes in the Ottawa region, while elsewhere red fox may avoid snowmobile trails. One study in Minnesota looked at track distribution patterns of cottontail rabbits, snowshoe hare, longtail weasels, ermine, and least weasels. They found that the number of mammal tracks crossing snowshoe trails was significantly greater than the number crossing snowmobile trails.

The potential for detrimental effects on populations of medium-sized mammals due to snowmobile-impacted small mammal prey populations has yet to be investigated.

Small Mammals

High mortality of small mammals in areas impacted by snowmobiles is attributable to a number of factors: extreme modification of the subnivean space (layer between base of snow and surface of ground); reduction of snow depth; greater snow density, thermal conductivity, thermal diffusion, and shear stength of snow; and perhaps to toxic levels of carbon dioxide trapped in the subnivean layer. Snow density increases due to snowmobiles may cause significant increases in energy cost of burrowing in small mammals. Snowmobiling occurs when food supplies are low and therefore the animals' ability to conserve energy may be critcal to survival.

Low winter temperatures are stressful to small mammals even when moderated by snow cover. Experimental compaction of a snowfield by snowmobiles has been shown to markedly increase winter mortality of small mammals. The reduction of these prey populations could reduce the populations of their corresponding predators such as hawks, owls, foxes, etc.

Lower snow temperatures brought on by loss of the insulating properties of snow after compaction may lead to significant increases in metabolic demand in subnivean mammals. Of the small mammals present at Ministik, many seem to be vulnerable, and include deer mouse, meadow jumping mouse, western jumping mouse, boreal redbacked vole, meadow vole; masked, dusty, water, arctic, and pygmy shrews. It is possible that prairie vole and northern bog lemming, both rare in the region, are present at Ministik, but the small mammals of the sanctuary await the required studies.

It is clear that the current levels of snowmobile use in the sanctuary are presently impacting the small mammals, and likely their predators.

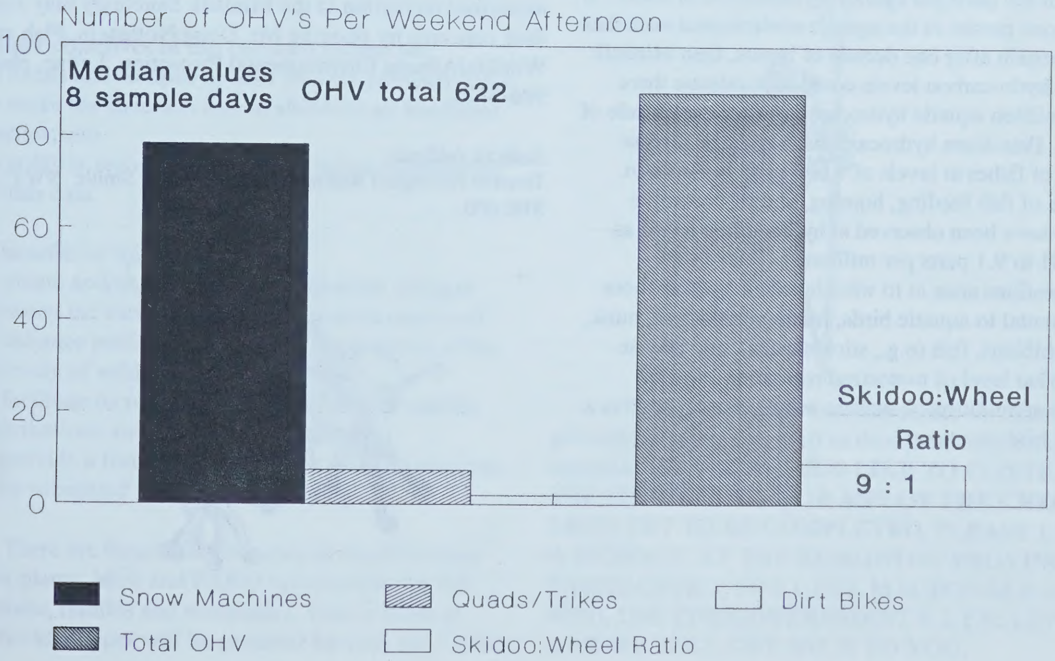
Birds

Impacts of snowmobile use on birds is both direct and indirect. Direct effects include depression of small mammal prey populations and habitat damage (see above sections). Indirect effects are traceable through changes to the function of the ecosystem, such as by loading waterbodies with hydrocarbons derived from snowmobile exhaust (see following section). The primary problem encountered in attempting to assess winter impacts on birds is the paucity of data.

Figure 2.

Ministik Sanctuary Winter 1993 OHV Stats

Data for Access Point 33, afternoon only



Amphibians and Reptiles

As all central Alberta amphibians and reptiles hibernate in winter, direct effects of snowmobiling should be negligible. It is possible, however, that any aquatic pollution introduced by snowmobiles could have impacts on breeding success of amphibians, as they are susceptible to low levels of water pollution during the aquatic stage of their life cycles (see following section). It is also possible that damage to wetlands during periods of low snow could impact breeding success. Ministik amphibians that may be impacted are wood frog *(Rana sylvatica)*, boreal chorus frog *(Pseudacris triseriata)*, Canadian toad *(Bufo hemiophrys)*, and tiger salamander *(Ambystoma tigrinum)*.

Invertebrates

The types of changes to the soil and snow thermal and gas exchange regimes documented under compacted snow would likely bring about changes to forest floor and wetland invertebrate populations. Any water pollution could cause changes to the teeming productivity of Ministik lakes and cause ripple effects through the food chains. Studies are needed.

Aquatic Impacts: Hydrocarbon Pollution of Surface Waters Due to Motorized Winter Recreation in the Ministik Sanctuary 1993.

If Ministik OHV use in winter for the entire sanctuary is twice that documented for Access Point 33 (winter weekend afternoons), then one winter's loading totals about 0.6 parts per million hydrocarbon in water. If hydrocarbons persist in the aquatic environment such that one-half remain after one decade of inputs, then Ministik Sanctuary hydrocarbon levels could approximate three parts per million aquatic hydrocarbons after one decade of OHV use. Petroleum hydrocarbons may cause disease and death of fishes at levels of a few parts per million. Disruption of fish feeding, homing, and reproductive behaviour have been observed at hydrocarbon levels as low as 0.01 to 9.1 parts per million.

Questions arise at to what levels of hydrocarbons are detrimental to aquatic birds, mammals (beaver, mink, etc.), amphibians, fish (e.g., sticklebacks), and invertebrates? What level of motorized recreation-induced hydrocarbon pollution of surface waters is acceptable in a migratory bird sanctuary?

Conclusions

Recreational vehicle use of public lands may be the most complex and controversial activity to confront today's ecosystem managers. Non-winter motorized recreation in the Ministik Sanctuary is clearly incompatible with the objectives of the management plan.

Under the proposed management plan, motorized winter recreation is classified as a restricted use. However, since the management plan has not been approved to date, motorized winter recreation is currently unrestricted. The compatibility of snowmobile use within the sanctuary is questionable. Given the documented impacts of snowmobile use outlined in this report, it is incumbent upon the Ministik advisory committee to bring under control recreational uses that are incompatible with conservation. High levels of unrestricted and unmonitored winter recreation are detrimental to the Ministik Sanctuary and non-conforming with the conservation objectives of the management plan. In light of alternate use areas, such as the Blackfoot Grazing Reserve, it may be in the best interests of the sanctuary to phase out all motorized recreation.

Recommendations

The advisory committee must decide if snowmobiling is to be allowed in the sanctuary. If snowmobile use is to continue, a legal agreement should be prepared between Alberta Environmental Protection and a snowmobile association.

All Alberta Naturalist readers concerned above motorized recreation in the Ministik Sanctuary may voice their concerns by phoning Mr. Doug Nothstein, Fish and Wildlife/Alberta Environmental Protection, Leduc, phone 986-6775.

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Alberta's Watchable Wildlife Checklist Series Project

Chel Macdonald and Pat McIsaac

A project is underway to produce a series of species checklists for some 60 sites where plant and animal viewing is particularly good. Many of the sites, including Natural Areas, Provincial Parks, Wildlife Sanctuaries, Alberta Forest Service Recreation Areas, Buck for Wildlife sites and municipal parks, are profiled in the Alberta Wildlife Viewing Guide (Lone Pine Publishing 1990).

This project was initiated and is being completed by Chel Macdonal and Pat McIsaac, Core funding support is being provided by the Alberta Recreation, Parks and Wildlife Foundation and by Alberta Environmental Protection.

Government offices, private agencies, clubs and individuals are being contacted to solicit species information for particular sites. While it is recognized that individuals and private agencies sometimes hold much of the species data for a site, they often do not have the resources available to compile and publish this information for themselves or their members. Further, when considerable site data has been collected by both private and government sources, they are often unaware of one another's information or even interest in a particular site. For sites where government data is not as extensive as private contibutors' data, the contributors will be made aware of the situation so that they may decide whether they wish to participate.

The major objectives of this checklist project are:

* to locate and compile species data for particular sites;
* to make the checklist data available to all interested parties; and
* to publicly recognize in print the major contributors of this data.

Other benefits of this project are:

* to create and/or enhance communication linkages between the various information sources contacted;
* to enhance public awareness and appreciation of the diversity of wildlife;
* to facilitate increased public knowledge of wildlife distributions and habitat relationships;
* to provide a format through which data can continue to be submitted for checklist updating.

There are three different types of checklists one each for plants, birds and FARM (an acronym for fish, amphibians, reptiles and mammals). One or more of these checklist types will be prepared for each site. About 40 checklists will have been completed as of April, 1993. When the project is complete, there will be about 140 checklists, reflecting the occurrence, breeding status or flowering period, abundance and habitat preference of recorded and/or expected species. Tips on proper wildlife-viewing etiquette are on each checklist. There is a list of the major contributors on the back as well as a contact name with a request for noteworthy wildlife sightings.

Copies of these checklists are being made available to the public through various government agency offices, information centres, non-government organizations and private outlets. The project is designed to allow primary distributors such as government offices, natural history clubs and nature centres to make their own photocopy reprints, add their sponsoring label or logo and recover their ongoing reproduction and distribution costs.

The following lists indicate checklists which are presently completed as well as those currently being compiled. **IF YOU WOULD LIKE TO CONTRIBUTE INORMATION FOR ANY OF THE CHECKLISTS YET TO BE COMPLETED, PLEASE LEAVE A MESSAGE AT THE EDMONTON PROVINCIAL PARKS OFFICE FOR CHEL MACDONALD (427-6791), USE THE GOVERNMENT R.I.T.E. LINE) AND WE WILL GET BACK TO YOU.**

CHECKLISTS COMPLETED IN 1992:

PLANT

Bow Valley/Yamnuska Mountain
Cardinal River Divide
Wagner Natural Area
Winagami/Kimiwan Lakes

BIRD

Beaverhill Lake
Bow Valley/Yamnuska Mountain
Brazeau Reservoir
Buffalo Lake
Lake Newell
Slack Slough
Therien Lakes
Wagner Natural Area
Winagami/Kimiwan Lakes

FARM

Bow Valley/Yamnuska Mountain
Sheep River Wildlife Sanctuary
Wagner Natural Area
Winagami/Kimiwan Lakes

CHECKLISTS COMPLETED IN APRIL, 1993:

PLANT

Cold Lake
Cypress Hills Prov Park
Lesser Slave Lake, East End
Red Lodge Prov Park
Sir Winston Churchill Prov Park
Vermilion Prov Park
Wyndham/Carseland Prov Park

BIRD

Cold Lake
Dillberry Lake & Vicinity
Lesser Slave Lake, East End
Red Lodge Prov Park
Whitney Lakes Prov Park
Wyndham/Carseland Prov Park

FARM

Cold Lake
Lesser Slave Lake, East End
Red Lodge Prov Park
Sir Winston Churchill Prov P
Vermilion Prov Park
Wyndham/Carseland Prov Park

CHECKLISTS TO BE COMPLETED BY OCTOBER, 1993:

PLANT

Big Knife Prov Park
Dry Island Buff Jump/Tolman Bridge

BIRD

Big Knife Prov Park
Dry Island Buff Jump/Tolman Bridge
McGregor/Traver's/Little Bow Reservoirs

FARM

Big Knife Prov Park
Dry Island Buff Jump/Tolman Brg

CHECKLISTS TO BE COMPLETED IN 1994:

PLANT

Beauvais Lake Prov Park
Beehive Natural Area
Big Hill Springs Prov Park
Big Sagebrush Natural Area
Bridge Lakes Natural Area
Buffalo Lake
Caw Ridge
Chain Lakes Prov Park
Crowsnest Lake & River
East Porcupine Hills Natural Area
Garner Lake Prov Park
Half Moon Lake Natural Area
Hand Hills Ecological Reserve
Kleskun Hill Natural Area
Lake Newell
Moose Lake Prov Park
Mt. Watt Natural Area
Pembina River Prov Park
Police Outpost PP/O. Wetlands NA
Red Rock Coulee Natural Area
Rumsey Ecological Reserve
Sheep River Wildlife Sanctuary
Taber Prov Park
Upper Bob Creek Ecological Reserve
Wabamun Lake
Whitney Lakes Prov Park
William A. Switzer Prov Park
Whitemud Creek

BIRD

Beauvais Lake Prov Park
Beehive Natural Area
Big Hill Springs Prov Park
Big Sagebrush Natural Area
Burnstick Lake
Cardinal River Divide
Chain Lakes Prov Park
Chip Lake
Crowsnest Lake & River
East Porcupine Hills Natural Area
Garner Lake Prov Park
Glory Hills/Devil's Lake
Hand Hills Ecological Reserve
Hay-Zama Lakes
Kleskun Hill Natural Area
Kootenay Plains Ecological Reserve
McKinnon Flats
Moose Lake Prov Park
Pakowki Lake
Pembina River Prov Park
Pigeon Lake
Police Outpost/Outpost Wetlands
Poplar Creek
Ram Falls
Red Rock Coulee Natural Area
Rumsey Ecological Reserve
Sheep River Wildlife Sanctuary
Slave River/Mountain Rapids
Thunder Lake Prov Park
Tyrell/Rush Lakes
Upper Bob Creek Ecological Reserve
Wabamun Lake

FARM

Beehive Natural Area
Big Hill Springs Prov Park
Big Sagebrush Natural Area
Brazeau Reservoir
Buffalo Lake
Cardinal River Divide
Caw Ridge
Crowsnest Lake & River
Cypress Hills Prov Park
East Porcupine Hills Nat Area
Garner Lake Prov Park
Hand Hills Ecological Reserve
Jessie Lake
Kootenay Plains Eco Reserve
Lake Newell
McKinnon Flats
Moose Lake Prov Park
Pembina River Prov Park
Pigeon Lake
Police Outpost/Outpost Wetlands
Ram Falls
Red Rock Coulee Natural Area
Rumsey Ecological Reserve
Slave River/Mountain Rapids
Therien Lakes
Thunder Lake Prov Park
Upper Bob Creek Eco Reserve
Wabamun Lake
Whitemud Creek
Whitney Lakes Prov Park
Willmore Wilderness Park

IF YOU WOULD LIKE TO CONTRIBUTE INFORMATION FOR ANY OF THESE CHECKLISTS, PLEASE LEAVE A MESSAGE AT THE EDMONTON PROVINCIAL PARKS OFFICE FOR CHEL MACDONALD (427-6791, USE THE GOVERNMENT R.I.T.E. LINE) AND WE WILL GET BACK TO YOU.

MANY THANKS TO THOSE WHO CONTRIBUTED TO THESE CHECKLISTS!!!

Swift Fox Comeback in Canada

Ludwig N. Carbyn

The Swift Fox Recovery Team, representing the Canadian Wildlife Service, Alberta Fish & Wildlife, Saskatchewan Parks, Recreation & Culture, and the University of Calgary, recently completed a three year experimental feasibility study on re-introductions of the Swift Fox *(Vulpes velox)* to the Canadian prairies.

The Swift Fox, a house cat sized predator once common in the prairies of Canada, disappeared from these regions during the first half of the 20th century. In 1978, the Committee on the Status of Endangered Wildlife in Canada designated the species as extirpated, setting in motion a project involving numerous agencies. Up to 1989 it was not certain whether successful re-introductions could be achieved. Therefore, the program was restructured emphasizing an experimental approach, using both captive-raised and wild-born (United States imported) foxes. Another such approach was to compare releases in the spring with those in the fall.

Results were very revealing. After three months of release, survival rates were 5 out of 27 (19%) for captive-bred foxes, as compared to 17 out of 28 (61%) for wild-caught animals. This trend of higher survival of the wild-caught foxes continued past three months up to 12 months. Further studies revealed that animals released in the fall also had a higher chance of success than those released in the spring.

The long-term survival of the fall-released group was both enlightening and encouraging. Over the years, the foxes had spread and were documented in at least 278 sections of land in southern Alberta and southern Saskatchewan. In the winter of 1991/92, the Canadian free-roaming population was estimated at a minimum of 225 foxes. Some animals had survived for four years and produced at least two litters of young. Since the program began in 2983 a total (minimum) of 49 pairs produced an average of 3.4 young per litter. The wild, Canadian-born young had a higher survival rate than the foxes released in the experimental project. Foxes also moved south from Canadian release sites into northern Montana. From 1986 to 1992, there were 12 records of swift foxes in Montana.

Dispersal of foxes from release sites varied with the highest recorded movement being 190 km. Wild-captured animals travelled greater distances, but consistently settled down in prairie habitats. Captive raised foxes moved shorter distances and were less consistent in their patterns, a few settling near buildings, while others settled close to brushy areas, cultivated fields, roads or human habitation.

The greatest source of mortality was predation by coyotes. Most of such deaths occurred within the first month after release. Other foxes were killed by avian predators, badgers and trappers, while a few became victims of road kills.

From its inception, this program has enjoyed a very high public profile. Formed in 1986, the Swift Fox Conservation Society has greatly contributed to the success of the project. In addition to broad urban support, there has been a core of local landowner support at the release site areas. The involvement of these ranchers has been consistent, strong and important to the success of the program. Field staff have actively fostered this support by talking with local residents and keeping them informed about the project.

The work completed to date indicates that the ecological requirements for survival of the swift fox are still in place in the fragmented Canadian prairie ecosystem. However, it is not certain whether the species can survive over longer periods, if drastic short term environmental changes such as drought, severe winters or long term climatic changes should occur.

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Moose Colonization of Treeless, Shortgrass Plains near Hanna, Alberta

Bob Gainer

Moose are normally considered a woodland species. Trees themselves are little utilized but the cover, browse, forbs, successional stages and water associated with forests are. Although population densities are low, moose also inhabit the treeless tundra (Kelsall, 1972; Miller *et al,* 1972). There they associate almost entirely with the foliage accompanying the river and creek valleys (Graf, 1992).

For some reason though, moose have not been a feature of the prairies. Several authors have pointed out the similarity of the habitat to that of tundra - treeless but with coulees, valleys and ditches supporting woody vegetation. Kelsall and Telfer (1974) speculate as to reasons why this is, but none seems to fit.

Hanna is the administrative center for the "Special Areas", the most drought prone region of the Palliser Triangle (which is in turn the most drought prone area of the Canadian prairies). South and east of the town it is as barren of trees as the continental tundra. North and west is the treeline; clumps of scrub aspen and willow are dispersed throughout the farmland.

Within the last five years there has been a noticeable extension of moose range well out into the parched, shortgrass plains, as much as 50 km south and east of the Hanna treeline, and as far east as Oyen and Kindersely. People find that they like to keep close to the planted trees and hedgerows surrounding farmsteads; there are a great deal of abandoned ones throughout the area.
Sometimes moose even inhabit particularly large windrows around occupied farmsteads. Though tame, if approached they move away. People have told me "If you take your eyes off them even for a second you won't see them again."

In addition to the windrows they are associated with the several species of willow, western snowberry, scrub aspen, karagana and other shrubs accompanying the creeks, sloughs, dams, dugouts, dried-up lakes, ditches, irrigation canals and watercourses in general throughout the regions. During the winter large round bales of alfalfa mixed hay are often left out in some of the fields with access to irrigation. To a minor extent these attract the attention of moose as well.

Although moose are renowed for their wandering or in general being less attached to a specific territory than other species, these animals appear to be relatively permanent. Recognizable individuals are consistently reported in this area of few people and enormous ranches. Mature and immature males and remales are observed and for several years young have been raised here.

Some of the reasons suggested by Kelsall and Telfer for moose inhabiting the tundra but not the prairies are heat, lack of water, lack of shade, habitat change associated with forest successional stages and a neurologic condition associated with Whitetail Deers' meningeal worm. There has been virtually no habitat change in this area in the last 75 years and there is no meningeal worm in Whitetails east of Manitoba. None of the factors discussed by Kelsall and Telfer explains the present day expansion of moose onto the prairies. Kelsall and Telfer do make mention of the dramatic effect that hunting by Inuit had on moose occupation with the increased access gained by snowmobiles.

In the five years I have spent in the Hanna area I have noticed other factors that may be important that Kelsall and Telfer did not specifically address. Virtually every wild animal population has increased in this area during the last 75 years. Oldtimers say there was never near as many mule deer (and no Whitetail in western Canada in general until about 50 years ago) as there is now. In the winter time large yards of both species seem to be everywhere. Less dramatic is the extension of Pronghorn winter range northward, but also waterfowl, raptors, Coyotes;...virtually every wild animal population has increased. Largely this has been because of an increased awareness and knowledge of conservation principles by the agriculture community. But another factor is definitely important.

In town, everyone knows a neighbor who has got venison or waterfowl for the asking. Hunters don't want very much of it and can't give it away unless it is in the form of spicy sausages. Canadians (it seems) have become used to young, grain fed, "finished" beef or other domestic stock for their fresh meat. They don't mind paying a little extra for tenderness and marbling.

In the old days things were different. People in this area were so poor they ate anything. During the depression many people ate gophers. It hasn't been until fairly recently that farmers could afford the luxury of butchering an expensive animal. Formerly they commonly ate "government" meat. Now if they do bother to shoot any game it is almost only used for sausage.

A moose would be about the most exposed animal possible out on the treeless plains. If they were around several years ago when pioneers relied on game for their meat they wouldn't have lasted long. In a matter of a day or two the entire population could have been eradicated from the prairies. Before this country was settled it may very well have been that moose were present as they are on the tundra, but the transition to homesteads and the instantaneous disappearance of moose may not have been noticed. The reason moose weren't a feature of the prairies for so long was because of the former attraction free meat had to the locals.

Nowadays with our relative affluence has also come a general tolerance for wildlife and a genuine awareness and appreciation for nature, especially among rural people. I find the stereotypes of the ignorant, insensitive uncaring rancher and the informed, sophisticated conservation minded urban dweller to be wrong.

During hunting season it is the urban dweller driving around our backroads with guns and bottles at the ready, dressed and outfitted from several different catalogues and the ranchers, peacefully raising a family and livestock by himself away from all the "maddening crowds", asking, actually praying that hunters are careful around his family and stock and buildings during the few frantic days out of their busy agenda when the city visits the country.

The result of the local disinterest in game for meat is an abundance and variety of the magnificent creatures nature has to provide this area. Sometimes locals do grumble about antelope taking off their bottom wires, moose taking off their top wires and deer everywhere damaging shrubs and hay stacks, but the only ones that ever shoot anything are the people from the city. The locals actually wouldn't mind if the deer harvest especially was increased significantly if there was only some way to live with "the urban hunter".

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Miller, F.L.E., E. Broughton and E.M. Land. 1972. Moose fatality resulting from overextension of range J. Wildl. Dis. 8:95-98

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The SongFinder

A Tool to Hear Those High Notes in a Bird Song Again

Cam Finlay

As people age, particularly males, they lose the ability to hear the high pitched songs made by many birds, including Kinglet, Brown Creeper and some of the notes emmitted by a Savannah Sparrow or a Winter Wren. I recently obtained a hearing device called the Songfinder, made by NatureSound Research in Ithaca, New York.

This machine is designed spcifically for bird watchers suffering from high frequency hearing loss, but who still have reasonably normal hearing to hold conversations with other people. It is a six by eight inch pack the size of, and worn like, a Sony Walkman.

I tried it out, both in the field and in the living room listening to tapes of some warblers, and was very satisfied. During the field tests I could even pick up the high notes of chickadees that I hadn't heard for several years.

The only concern is the cost - $950.00 American. However, if money is no problem, I recommend you at least try it. It will not increase the volume, only change the pitch of the notes. If your hearing is still fairly good for volume, this is the machine for you.

Before ordering, NatureSound recommends you have an audiologist test your hearing, paying particular attention to the high frequency notes. Then send the audiogram so that a SongFinder can be custom-built for you. Upon receipt you have a 10-day trial period to try it out. If you are not satisfied they will refund the full amount minus postage and handling charges.

The SongFinder works on a frequency dividing principle. Bird song notes with a frequency of 3000 to 12,000 Hz (human voices usually go up to around 2000 Hz) are converted into digital signals and then acted upon by an internal computer to bring about frequency division. As a result, the high frequency notes are lowered into the 1000 to 3000 Hz range, where your normal hearing can pick them up.

When using the unit you can reduce or lower these notes by one half, one third or one quarter, according to your hearing ability. For example: bird songs with very high 12,000 Hz notes (such as some of the warblers) can be reduced to 3000 Hz when quartered.

Also, a special filter in the SongFinder responds only to high frequency sounds in the 3000 to 12,000 Hz range which includes the highest frequency notes made by birds. Extreme amplification of these notes is not involved and, thus, extraneous sounds such as snapping twigs do not become annoying. Sensory overload is completely avoided and feedback squeal does not occur. The pitch-lowered sounds blend nicely with noises you already hear.

The two microphones, one placed at each ear, pick up the incoming notes (which are lowered separately for each ear) and feed them back to the ear via miniature earphones; these earphones do not impair normal hearing. With this biaural device a user can readily judge the direction and distance of incoming sounds.

The pitch-lowered song notes retain the same subtle quality and timing as in the originating song. While the frequency is lowered, the relationahip among and between notes is maintained. The notes you hear are just lowered in pitch. Your memory of what a bird used to sound like will help you to recognize the lowered song notes you now hear. In general, the familiar bird song notes are fairly easy to recognize when divided in half, but those divided in a third or quarter are somewhat of a greater challenge.

For more information on this unique and useful machine, contact the NatureSound Research Co., P.O. Box 84, Ithaca, New York, 14851, USA or phone (607)257-4995.

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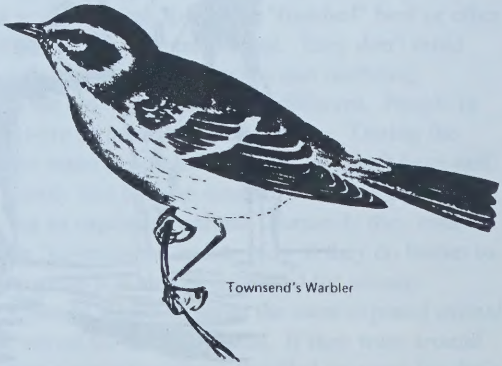


Townsend's Warbler

A Ruffed Grouse's Last Meal

Geoffrey L. Holroyd, Elisabeth G. Beaubien and W. Michael Holroyd

Glass windows cause many wildlife deaths but occasionally such untimely deaths provide an opportunity to learn something about wildlife ecology.

On November 9, 1991 we visited our cabin on Gregg Lake, 30 km north of Hinton, Alberta. We discovered a male Ruffed Grouse *(Bonasa umbellus)* encased in the snow on the back step. Weather records from the Black Cat Ranch, 20 km to the south, show snowfalls of 56 cm on October 15 and 16, 28.4 cm from 21 to 26 October and 10 cm on November 5. The snow had accumulated 30 cm deep on the ground. From his position between snow layers, we assume that he flew into the door window between October 16 and November 5 and mostly likely between October 16 and 21.

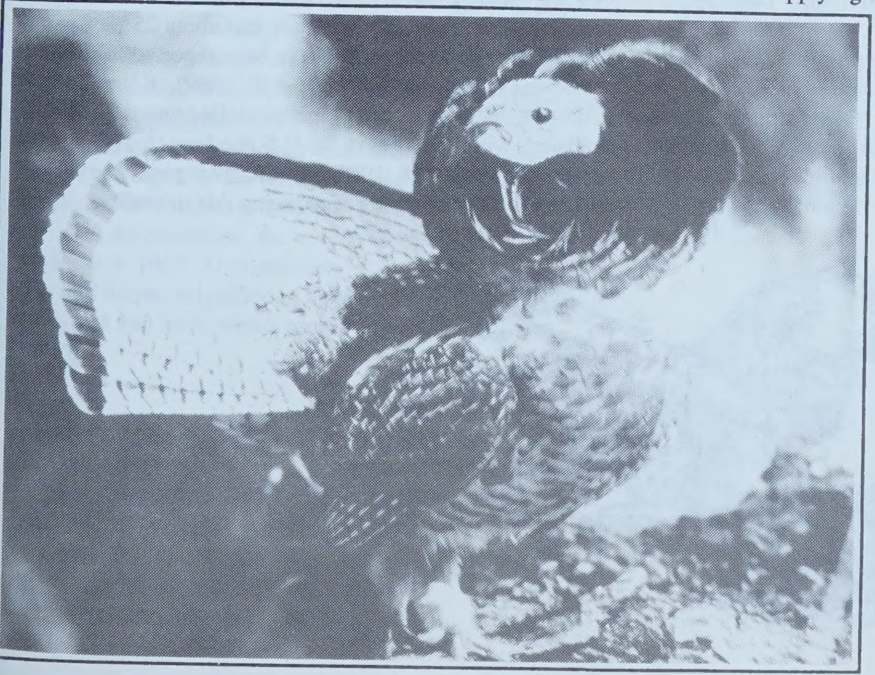
A superficial autopsy revealed clotted blood in the neck but no obvious concussion on the skull. The window faces west and is highly reflective on sunny afternoons. We suspect that the grouse flew into the window and broke its neck on impact.

Although his death was premature, the periodic snowfalls hid and preserved his carcass allowing us an opportunity to see his last meal. The contents of this grouse's crop were a colourful array of red, green and yellow. Half of the items in his crop were buffaloberry buds but most of the bulk were rosehips (Table 1). We do not know the nutritional value of each item, but rosehips are supposed to be high in vitamin C and E. Presumably the varied diet reflects nutritional needs of grouse at this time of year. The green leaves and stem ends of the pea vine are noteworthy because of the snow that covered the ground except at the base of conifers. Likely the grouse had found the pea vine stalks and leaves growing there. Aspen and balsam poplar are very common trees in the area (as are the two shrubs mentioned above) and were easily accessible above the snow.

East of the cabin on the lakeshore is a small hill covered with spruce where grouse droppings and roosting grouse have been seen from time to time. Possibly the bird was heading for an evening roost site with a full crop of food to digest overnight.

The winter diet of Ruffed Grouse is known to include buds of trees and shrubs, and small herbaceous plants (Terres 1980). The contents of this grouse's crop gives us some idea of the types of vegetation that are eaten in autumn in the foothills of Alberta.

We thank Len Fehr, Atmospheric Environment Service, Environment Canada, Edmonton; and the Black Cat Ranch for supplying the weather data.



Ruffed Grouse -
Drumming Display

Photo: Geoffrey L. Holroyd

Table 1. **Stomach contents of the Ruffed Grouse *(Bonasa umbellus)*.**

Species	Items		Dry weight	
	N	%	gm.	%
Rosehips *(Rosa* spp. probably *woodsia)*	24	21	7.7	77
Buffaloberry buds *(Shepherdia canadensis)*	58	51	1.1	11
Aspen buds *(Populus tremuloides)*	20	18	0.7	7
Balsam buds *(Populus balsamifera)*	3	3	0.2	2
Balsam twigs (1 cm long)	2	2	0.2	2
Yellow Pea Vine *(Lathyrus ochroleucus)*	6	5	0.1	1

Literature Cited

Terres, J.K. 1980. The Audubon Society Encyclopedia of North American Birds. Knopf Inc, New York.

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(GLH) Canadian Wildlife Service, Room 210, 4999 - 98 Avenue, Edmonton, Alberta T6B 2X3; (EGB) Devonian Botanic Garden, University of Alberta, Edmonton, Alberta T6B 2E1; and (WMH) 4123 - 122 Street, Edmonton, Alberta T6J 1Z1.

Window Kills

A Recent survey by Project Feeder Watch indicated that 9% of Feeder Watch sites recorded window kills during the winter of 1989-1990, averaging 2.0 birds killed per kill site (Anonymous 1991. North Dak. Nat. Science Soc. Newsletter 8(3):17-18). Most birds were killed when attempting to flee from predators, during an altercation with other birds at the feeders or when frightened by a loud noise nearby. Black netting mounted on frames near the window has been effective in reducing the numbers killed. Woodland and tree-loving species were disproportionately represented among the kills (Cornell Laboratory of Ornithology. 1991. Cardinal 145:20-21.) Versions of this report were also published in Blue Jay News 90:1, 1992 and (by E.H Dunn) in Alta. Nat. 21:130-131, 1992. A review of bird-window collisions by Daniel Klem, Jr. suggests that about 25% of Norh American Bird species have been reported to strike windows (Wilson Bull. 101:606-620, 1989). Klem estimates that 97.6 million birds are killed annually from collisions with windows in the U.S.A. alone (Journ. Field Ornithol. 61:120-128, 1990). In the latter paper, he suggests several methods of reducing this mortality.

Hurrah for Whoopers!

Theresa Aniskowicz

The Calgary Zoo has become the new home for the founding members of Canada's first captive breeding flock of endangered Whooping Cranes.

On November 13, 1992, a pair of cranes from the International Crane Foundation arrived at the zoo's breeding facility, and another two birds from the Patuxent Wildlife Research Centre were shipped on December 9th. The flock will be augmented with new birds whenever opportunities arise, and is part of a joint Canada-US recovery plan for the endemic North American bird.

Estimates indicate that the Whooping Crane numbered 1300-1400 individuals in 1870. By 1941, the last remaining flock had dwindled to 15 or 16 birds. Another nonmigratory flock in Louisiana had dropped to only six birds and soon disappeared.

Today, the only truly wild flock of whooping cranes nests in the Wood Buffalo National Park (WBNP) area on the Alberta-Northwest Territories border and winters at the Aransa National Wildlife Refuge in coastal Texas. By the time that flock's breeding site was discovered in 1954, the population had increased to 21 birds.

Scientists soon realized that although most whooping crane pairs lay two eggs, only one chick survives. In 1967, they began removing "surplus" eggs and transferring them to the Patuxent Wildlife Research Centre in Maryland where a captive flock was established.

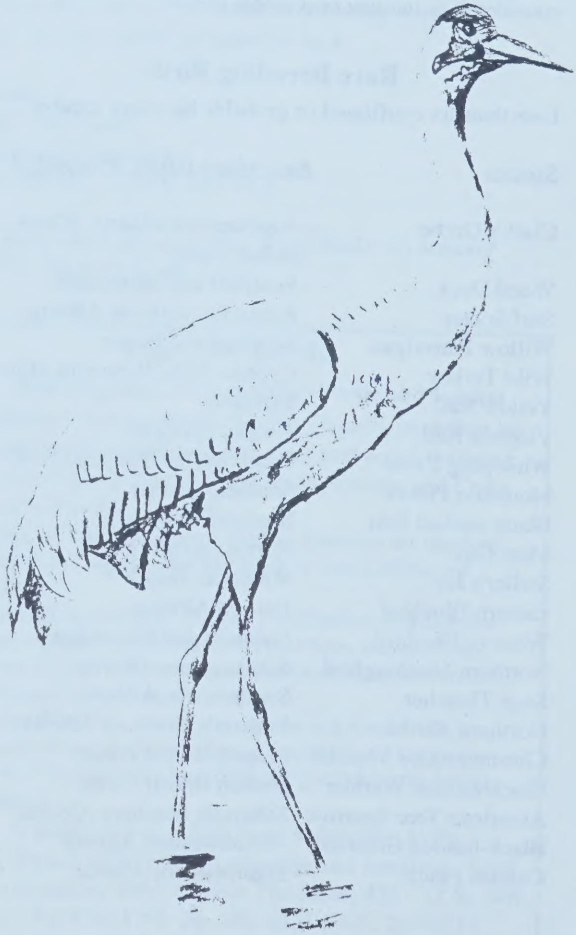
In 1975, some eggs from WBNP were shipped to Grays Lake National Wildlife Refuge, Idaho, in the hope of establishing a new migratory flock. Unfortunately, Whooper chicks hatched and raised by Sandhill Crane foster parents failed to reproduce. Consequently, the transfer of eggs to that facility was terminated in 1989.

Instead, in 1990, eggs were sent to the International Crane Foundation at Baraboo, Wisconsin, to start a second captive flock which now numbers 70 birds.

In the meantime, the wild WBNP flock peaked at 146 birds in 1989. Unfortunately, some serious losses occurred during migration. Despite that, in 1992 the flock numbered 140 birds with a record 40 pairs nesting in WBNP.

There are plans to establish a wild nonmigratory flock in Florida, as well as a second migratory one breeding in Canada. It is hoped that the Calgary Zoo will provide birds for the latter flock. Zoo staff members expect that it will take the cranes about three years to become well established at the breeding facility. Once that is achieved and the flock is sufficiently large, several of the birds will be moved to a public viewing area as part of an interpretive program aimed at improving public awareness and education regarding the cranes and the ongoing recovery effort.

Reprinted from Nature Alert - Canadian Nature Federation, 453 Sussex Drive, Ottawa, Ontario K1N 6Z4.



Rare and Very Rare Breeding Birds of Alberta

as determined by the Atlas of Breeding Bird of Alberta

Don Stiles

The Atlas of Breeding Birds of Alberta has provided an indication of which birds are rare breeders. Below are two lists, with arbitrary definitions for each.

1) Rare Breeding Birds are defined as those with less than six confirmed or probable breeding squares for the period 1987-1991 when atlassing was done.
2) Very Rare Breeding Birds are defined as those which had no confirmed or probable breeding squares in the atlassing period, but had been recorded previously as breeding in Alberta.

In most cases breeding evidence which does not fall within the area where found or expected should be considered as outliers or possible errors.

Rare Breeding Birds

Less than six confirmed or probable breeding squares

Species	Area where found, or expected
Clark's Grebe	- Southeastern Alberta, (Crow Indian Lake)
Wood Duck	- Foothills and Mountains
Surf Scoter	- Subarctic Northern Alberta
Willow Ptarmigan	- Northwest of Jasper
Wild Turkey	- Cypress Hills, Porcupine Hills
Yellow Rail	- Parkland
Virginia Rail	- Prairie, Parkland
Whooping Crane	- Wood Buffalo National Park
Mountain Plover	- Southeast corner
Black-necked Stilt	- Southern Alberta
Mew Gull	- Northeast corner
Steller's Jay	- Waterton, Jasper
Eastern Bluebird	- Eastern Alberta
Western Bluebird	- Foothills and Mountains
Northern Mockingbird	- Southeastern Alberta
Sage Thrasher	- Southeastern Alberta
Northern Shrike	- Subarctic Northern Alberta
Chestnut-sided Warbler	- Eastern Boreal Forest
Blackburnian Warbler	- Eastern Boreal Forest
American Tree Sparrow	- Subarctic Northern Alberta
Black-headed Grosbeak	- Southwestern Alberta
Cassins Finch	- Southwestern Alberta

Sufficient censusing in a few cases has resulted in some relatively rare breeding birds missing this list by having just over five confirmed or probable breeding squares. Two which come to mind are local breeders such as the Sage Grouse which breeds only in southeastern Alberta, and the Black Swift which breeds only in the mountains.

Very Rare Breeding Birds

Not confirmed or probable breeding records from 1987-91

Species	Area where found, or expected
Red-throated Loon	- One confirmed breeding record in the Caribou Mts. in 1976.
Pacific Loon	- Two breeding records from the Canadian Shield region, 1972, 1986.
White-faced Ibis	- Breeding confirmed at Pakowki Lake prior to 1987, and again at Stirling Lake near Lethbridge (1992).
Semipalmated Plover	- One confirmed breeding record from Wood Buffalo Naional Park, 1982.
Least Sandpiper	- Possible nesting sites from Lake Athabasca, 1972.
Red-necked Phalarope	- On confirmed nesting record from the Caribou Mtns., 1980.
Common Poorwill	- Known to be present in the Cypress Hills of Saskatchewan, and occasion ally seen in southeastern Alberta, south of Cypress Hills (1991).
Gray-cheeked Thrush	- Several breeding records from the Caribou Mtns. 1973-1976, and Jasper National Park, 1976-1980.
Nashville Warbler	- One confirmed breeding record in Southwestern Alberta, 1980. Known to breed in the Rocky Mountains area of B.C.
House Finch	- One breeding record from north west Calgary in 1984. (Collister 1986). Present in the Columbia River valley of B.C.

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Letter to the Editor - Bird Sightings

To the Federation of Alberta Naturalists:

I do not belong to your organization or any bird watching group. However, my husband and I spend considerable time fishing and hunting in a number of areas in Alberta. Over the years I have taken a keen interest in observing the birds in the areas that we frequent. This year, I kept a notebook with me and listed all the birds that I positively identified. My main source of reference was "The Birds of Alberta" by Salt and Salt.

On May 30, I observed a pair of Winter Wrens along an unnamed creek that crossed the North Prairie Creek Road approximately the E half of Section 36 Township 61 Range 16 west of 5 m. We were in very thick bush downstream of the road some distance.

On June 8, I observed a Red-headed Woodpecker on the eastern edge of the town of High River and a second one the same day in the vicinity of a well treed farm yard, east side of Highway 2, several kilometres south of High River. My daughter's in-law farmed in the Brant area and they told me that they often saw these woodpeckers in their yards. Maybe you need to interest someone in that area in becoming a bird watcher!

On October 3, I observed a family of Mountain Bluebirds accompanied by a Western Kingbird on an old clear cut area - west side of the Eagle Tower Road, northwest of Whitecourt - east half of Section 36, Township 61, Range 16 W 5 m. We lived in that area in our trailer for a total of four weeks, commencing Sept. 18, 1992. Other interesting sightings in that same area were Cape May Warblers, Orange Crowned Warblers, Palm Warblers, Ruby-crowned Kinglet, Redpolls, White phase Gyrfalcon, Broad winged Hawk and Northern Black-backed Woodpeckers and Three toed Woodpeckers. There is a great deal of clear cut logging going on in all this area. It greatly concerns me as it removes so much habitat necessary for the song birds and the woodpeckers.

Our main areas that we visit during spring, summer, and autumn are - southwest and west of Rocky Mountain House to Ram Falls and Lynx Creek area; south of Edson in the area of Prest and McNeil Creeks and McLeod River; Rock Lake near Willmore Wildernes Park; northwest of Whitecourt in the vicinity of Eagle Tower Road, Sakwatamau River and south to Athabasca River; Red Deer River valley east of Lousana; and the Athabasca Forestry Road southwest of Breynat. If there are any particular bird species in any of these areas that you would be interested in my observations please let me know. We are retired and spend as much time outdoors as possible, walking many miles in all the areas. I know I will make good use of the "Atlas of Breeding Birds"; there is so much useful information in it.

Sincerely,
Lorna E. McDonell,
9 Meadowood Crescent,
Sherwood Park, Alberta T8A 0L6.

P.S. There was a robin feeding at my feeder on January 11, 1993. He looked very cold!

For The Birds

The film series on migratory birds and habitat protection is now available for $29.96 each, including tax, you can buy the newly released three part series featuring a festival of birds of northern Alberta, Ontario and Costa Rica on VHS videocassette.

"Singing In The Rainforest" (26 min.) features the fabulous wood warblers singing their hearts out in Lac la Biche and Costa Rica.

"Birders Of A Feather" (23 min.) is a festival of shorebirds from Beaverhill Lake, warblers in Point Pelee National Park, and exotics including the Resplendent Quetzal at Moneverde Cloud Forest Preserve in Costa Rica.

"For The Birds" (22 min.) stars Arrow and Apollo, the downtown Peregrine Falcons from Edmonton, and the people involved in bringing this incredible bird back from the brink of extinction.

A portion of all profits from video sales to the AWA. Please add $7.00 for shipping and handling. Send cheque or money order to: For The Birds, 455 - 12 St. NW, Calgary, AB T2N 1Y9. Ph. 283-6201 FAX: 283-6214.

In Edmonton the VHS videocassettes can be obtained at the Wildbird General Store, 10429 - 80 Ave., Edmonton, AB T6E 1V1. Phone: 439-7333.

Canadian Lakes Loon Survey

Harry Vogel
CLLS Project Biologist and Coordinator

Judith McIntyre, a well know loon researcher, has referred to Common Loons and their eerie calls as "the symbol of wilderness, the positive affirmation of wild places, wild things, and wild sounds in the night." Unfortunately, loons may be suffering from human activities. The Canadian Lakes Loon Survey (CLLS) is seeking to answer concerns about the loon's future in Canada by continuing to expand its network of loon watchers across the country.

The CLLS is a long-term monitoring program designed to determine the effects of acid rain and other human disturbance on the reproductive success of Common Loons on lakes across Canada. These aquatic birds are dependent on their nesting lake for resources to sustain themselves and raise their young. They may be extrememly vulnerable to anything affecting water quality. Recent survey results suggest that loons may have difficulty raising young on lakes susceptible to acid precipitation. On severely affected lakes, loon chicks may starve to death because of low fish numbers. In addition to these obvious effects, increased acidity can release previously inert metals which then enter the food-chain and may accumulate and reach toxic levels in loons. The well-being of adults and chicks can be interpreted as a reflection of the state of the environment in their nesting area.

Lake acidity is not the only problem loons have to contend with in Canada, however. Loon legs are placed far back on the body, making loons powerful swimmers but virtually helpless on land. Loon nests are typically built right on the shore to minimize laborious climbs into and out of the water and provide a quick escape from perceived danger. Favourite sites include small islands, marsh edges or points of land. Cottages built on or close to the shore can displace a loon from its traditional nesting site. Fluctuating water levels can swamp a nest, or leave it stranded high out of the water and unreachable. The wake from motorboats can also swamp nests and wash out loon eggs.

Hundreds of volunteers are already surveying lakes across Canada, collecting important information on the effects of pollution, development and other human disturbances on loon nesting and chick survival. The Canadian Lakes Loon Survey requires assistance from people who can visit lakes at least three times during the summer -- June to watch for resident adults, July to look for newly hatched chicks, and August to record the number of chicks surviving the summer. Information is needed from every type of lake -- from pristine wilderness retreats to busy cottage intersections. You don't even need a pair of nesting loons to do a survey on your lake. It is vitally important to know which types of lakes are not occupied by nesting loons and to determine which factors might exclude loons from an area. Each completed survey form will provide valuable information.

Anyone wishing to become a volunteer surveyor should send their name, mailing address, and the name and location of the lake or lakes they wish to survey to: Canadian Lakes Loon Survey, Long Point Bird Observatory, P.O. Box 160, Port Rowna, Ontario, N0E 1M0, (529)586-3531. A survey kit, complete with instructions, a report form, and information about conservation education signs and nest-site warning signs will be sent, free of charge, to anyone able to survey a lake or large river. All CLLS volunteers receive the annual newsletter each fall.

The Canadian Lakes Loon Survey is a project of the Long Point Bird Observatory, an independent, non-profit organization that conducts studies promoting the conservation of wild birds and their habitats. The CLLS is funded by Northern Reflections, the Canadian Wildllife Service, the Environmental Partners Fund of Environment Canada, and charitable donations of CLLS participants.

Thank you for helping to spread the word about the Canadian Lakes Loon Survey!

Author's Address:
Candian Lakes Loon Survey, Long Point Bird Observatory, P.O. Box 160, Port Rowan, Ontario, N0E 1M0.

Footner Lake Forest - River Inventories

In 1992, Alberta Parks Service, Alberta Forest Service, and Fish and Wildlife staff began a series of cooperative biophysical inventories of significant rivers within Footner Lake Forest. These inventories establish a sourcebank of information that can be referenced, updated and investigated further. The following areas of study were investigated:

- vegetation and soils/land forms
- wildlife sign, sightings, and habitat (including fish, birds)
- forest pests and disease
- watershed characteristics
- recreation potential
- cultural/historic sites and traditional use of the river

In 1992, four stretches of river were inventoried.

Petitot River
(from Thurston Lake to 8 km north of Bistcho Lake)
Hay River
(Meander River junction to Steen River junction)
Wabasca River
(highway crossing at South Tall Cree Reserve to Peace River)
Ponton River
(Margaret Lake to 15 km downstream to the lake).

In 1993 we expect to inventory five stretches of river.

Chinchaga River
(May 31 to June 4 - Forest boundary to Hay River)
Hay River
(early August - Steen River junction to NWT border)
Wabasca River
(late July - Forest boundary to South Tall Cree Reserve)
Peace River
(various times - entire length within the Forest)
Ponton River
(early June - Caribou Mtns. escarpment to Peace River)

These canoe/boat trips will begin in late May and continue through the summer when river flows are an appropriate level.

We welcome voluntary participation in these inventories from any of you who are prepared to share your expertise in one or more of the areas of study mentioned above. The dates of these trips are still tentative at this time.

Congratulations are in order for the Footner Lake Forest people on their new ECOSYSTEM NEWSLETTER. For those of you who would like to take part in these efforts to inventory this area, here are some of the river stretches and the names of those to contact:

Barry Onysty, Forest Officer 1, Rainbow Lake, 956-3919
Jim Lunn, Forest Officer 11, Fort Vermilion, 927-3235
Bernie Schmitte, Forest Officer 1, High Level, 926-3830
Dale Huberdeau, Forest Protection Officer, FHQ 926-3761

CASINO

Fundraising for several projects including Alberta Native Plant Council's "The Altas of the Rare Vascular Plants"

October 15 - 16 1993

PALACE CASINO
West Edmonton Mall

We need a minimum of 30 volunteers for 6-7 hour shifts
Daytime: 11:00 a.m. - 6:00 p.m.
Evening: 6:00 p.m. - 12:30 a.m.

Contact FAN office at 453-8629 for volunteer forms. These must be completed and submitted to FAN, Box 1472, Edmonton, AB T5J 2N5, prior to August 15, 1993.

(Gaming rules do not allow you to work the Casino if you have not preregistered).

* * *

FEDERATION OF ALBERTA NATURALISTS

F.A.N. Membership Fees Are: Regular $15 per year; Supporting, $25 or more per year (with excess over $15 being deductible from your taxable income). This entitles you to a subscription to the Alberta Naturalist.

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Fall 1993

ALBERTA NATURALIST

Alberta's Natural History Review

For Reference
Augustana University College
Library
Not to be taken from the library

A New Variety of Grass - Rare and Endangered Species - How Many Birds?
Valley Of The Falcons - *Colias alexandra*

ALBERTA NATURALIST

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CONTENTS

President's Page 1

Editor's Announcements 2
Canmore Filmmaker Wins Trip Crown
1993 Prairi Conservation Awards
The Wildlands Project
New Canadian Nature Television Network

AEC Highlander - A New Variety of Grass 3

Rare and Endangered Species of the Castle Wilderness,
Michael Gerrand and Dave Sheppard 5

How Many Birds In A Day?,
Elizabeth Savoy 11

Valley Of The Falcons, Dick Dekker 12

The *Colias alexandra* complex in Alberta,
Norbert G. Kondla 16

Book Review
Butterflies of Alberta, John Acorn 21

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Printing: Percy Page Centre

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, Curtis Pollock, Box 1844, Vermilion, AB T0B 4M0.
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forestry Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Patron: Hon. Dr. J.W. Grant MacEwan

The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) to promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into approptriate actions.

BOARD OF DIRECTORS

Past President: Don Stiles, 20 Lake Wapta Rise, Calgary, AB T2J 2M9.
President: Barry Jenkins, 20 Forest Drive, St. Albert, AB T8N 1X2.
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Recording Secretary: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0.
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CORPORATE MEMBER CLUBS

Alberta Native Plant Council, Box 52099 Garneau, Postal Outlet, Edmonton, AB T6G 2T5.
Alberta Speleological Society, Box 2474, Jasper, AB T0E 1E0.
Bow Valley Naturalists, Box 1693, Banff, AB T0L 0C0
Buffalo Lake Naturalists, Box 1802, Stettler, AB T0C 2L0.
Calgary Field Naturalists' Society, Box 981, Calgary, AB T2P 2K4.
Edmonton Bird Club, Box 1111, Edmonton, AB T5J 2M1.
Edmonton Natural History Club, Box 1582, Edm., AB T5J 2N9 8G8.
Grasslands Naturalists, Box 2491, Medicine Hat, AB T1A
Lethbridge Naturalists' Society, Box 1691, Leth.., AB T2J 4K4.
Peace Paarkland Naturalists, Box 1451, Grande Prairie, AB T8V 4Z2.
Red Deer River Naturalists, Box 785, Red Deer, AB T4N 5H2.
Vermilion River Naturalists, Box 1769, Vermilion, AB T0B 4M0.

Associate Members: Beaverhill Bird Observatory
Earth Care Peace Study Centre

President's Page

R. Barry Jenkins

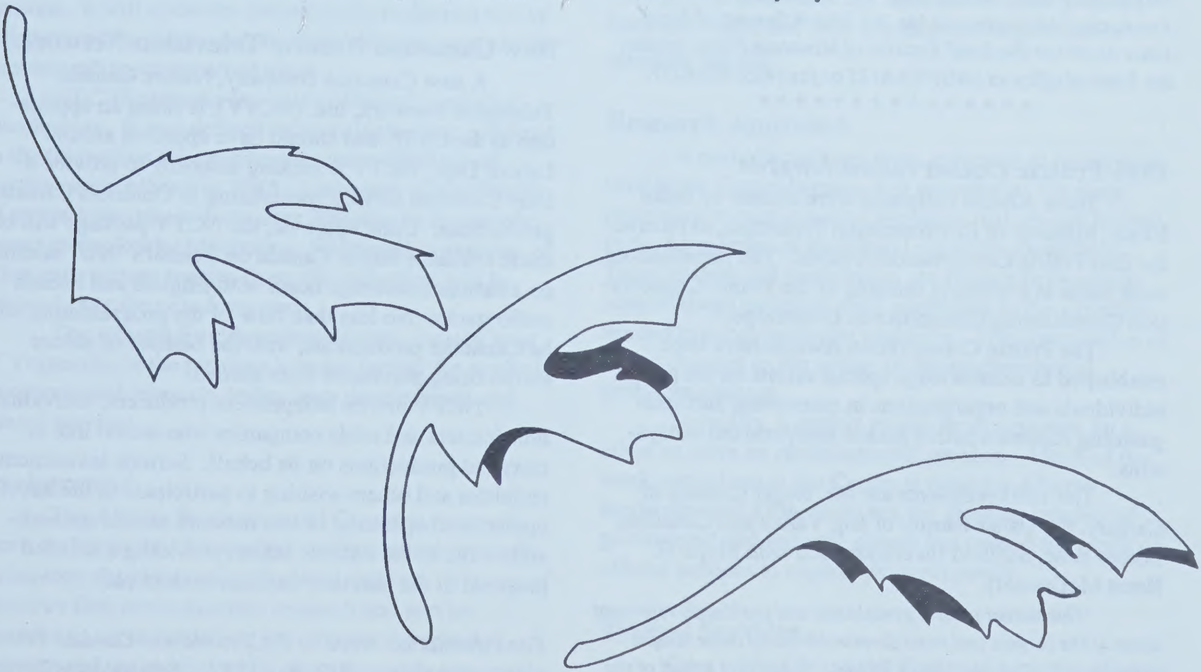
Summer is over; it seems that I just finished cleaning the last of the ice off my driveway and it is about to come back. Winters seem so short and summers almost non-existent. I have been president of FAN for almost two years now but it certainly doesn't seem that long. The new president will take over in January and I will have mixed feelings about it. I have greatly enjoyed being in the thick of it but I will be glad to pass on the torch.

It has been a very interesting two years - between publishing the Bird Atlas, hiring an executive director, the introduction of the Natural Resources Conservation Board and the Special Places initiative. There is so much to do and only a limited amount of time and, as a result many projects, especially the Special Places joint initiative between FAN, CPAWS, AWA and the provincial government, have not got the time I would have liked to put into them.

Looking toward the future of FAN is very interesting. With an executive director we should be able to provide a much more support for the member clubs, especially in the area of passing on information. The office in Edmonton receives a flood of reports, newsletters, conference announcements etc. which due to lack of resources we have not been able to pass on to the member clubs and individual members. Hopefully we will now be able to make this information available to those who have an interest.

The thing about FAN that is great is the people who volunteer their time and labour, from manning the casino fund raiser to sitting through weeks of NRCB hearings. I would like to thank everyone who has and hopefully will continue to support our projects. In particular I would like to thank Barb Levesque (sp?) who has been our eyes and ears in Hinton for several difficult years and who is moving to B.C. I would also like to thank the volunteers who are working the October casino in Edmonton. The funds raised will be used toward the publishing of Rare Vascular Plants of Alberta, a project of the Native Plant Council, and toward the further development of a natural history data base. The Bird Atlas data base is the core of this proposed data base but it may also include other animal and plant data including the Christmas and May counts.

Have a good fall and try to come to the AGM in Calgary in January if you can.



Editor's Announcements

Canmore Filmmaker Wins Triple Crown

Canmore filmmaker Roger Vernon, C.S.C., has been awarded the Bill March Summit of Excellence Award by the Banff Festival of Mountain Films, his third award this year.

Vernon was part of the team recognized with an Academy Award nomination for Best Cinematography on Clint Eastwood's film Unforgiven. His second honour was his induction into the prestigious Canadian Society of Cinematographers (C.S.C.). And now he is being honoured with the Festival's highest mountain achievement award.

Sponsored by the One Step Beyond Adventure Group of Canmore, the Bill March Summit of Excellence Award is presented annually to an individual who has made outstanding contributions to the mountain community and mountain filmmaking. This award is dedicated to the memory of Bill March, who displayed his own commitment to excellence through his leadership of the "82 Everest expedition and his training of several generations of outdoor recreational professionals in the physical education faculty of the University of Calgary. March passed away in 1990.

The Award will be presented to Vernon at the closing ceremonies of the 18th Annual Banff Festival of Mountain Films, taking place November 5-7.

For further information on the Bill March Summit of Excellence Award or the Banff Festival of Mountain Films, contact the Festival office at (403)762-6125 or fax (403)762-6277.

* * * * * * * * * * * * * * *

1993 Prairie Conservation Awards

Three Alberta recipients were chosen by Brian Evans, Minister of Environmental Protection, to receive the first Prairie Conservation Awards. The presentations were made at a working meeting of the Prairie Conservation Coordinating Committee in Lethbridge.

The Prairie Conservation Awards have been established to acknowledge special efforts on the part of individuals and organizations in conserving and safeguarding Alberta's native prairie and parkland ecosystems.

The 1993 recipients are Mr. Roger Creasey of Calgary, the Usher Family of Big Valley and Canadian Forces Base, Suffield (in conjunction with Major H. Brent McDonald).

"Our native prairie grasslands and parklands represent some of the largest and most diverse blocks of these unique ecosystems in Canada," says Evans. *"I am very proud of the people we honour today. Recognition for their efforts and involvement in the preservation and conservation of valuable prairie habitats, and the wildlife species they support, is well deserved."*

The Wildlands Project

Dr. Reed Noss, Science Director for the Wildlands Project, has been selected as a 1993 Scholar by the Pew Scholars Program in Conservation and the Environment. The Pew award honors those whose careers have demonstrated leadership and commitment to both scholarship and environmental action in preserving biodiversity.

Reed Noss is a conservation biologist who has applied science to the visionary protection and restoration of regional landscapes. He authored a model being used throughout North America to select and design core reserves, corridors and buffers, and has applied the model in several regions as exemplified by a Preliminary Conservation Plan for the Oregon Coast Range. As Science Director for the Wildlands Project, Reed facilitates conservation planning efforts for dozens of regional groups throughout the continent.

The recognition of Reed's work by the Pew Scholars program will allow him, in conjunction with his editorship of the journal *Conservation Biology,* to continue to provide a profound and creative leadership role in the protection of biodiversity and ecological integrity. Reed and nine other scholars were chosen from a field of many highly qualified candidates.

For more infomation contac, Rod Mondt(602)884-8075.

* * * * * * * * * * * * * * *

New Canadian Nature Television Network

A new Canadian company, Nature Canada Television Network, Inc. (NCTV), is filing an application to the CRTC and should have approval around Labour Day. NCTV is seeking authority to provide a truly Canadian service specializing in Outdoors Canada productions. Upon approval, the NCTV package will be made available across Canada on Telesat's "KU" satellite on a national coverage beam with English and French audio tracks. No less than 60% of the programming will be Canadian productions, with the balance of nature shows being purchased from abroad.

NCTV invites independent producers, individuals, broadcasters and cable companies who would like to carry out productions on its behalf. Serious investment enquiries and others wishing to participate in the development and operation of this network should immediately write to the address below, providing a detailed proposal of the part they can and wish to play.

For information Write or FAX to Nature Canada Television Network Inc., P.O. Box 11721, Edmonton, Alberta T5J 3K8. FAX (403)973-3571.

AEC Highlander - A New Variety of Grass

Vegreville - AEC Highlander, a new variety of native grass, will be responsible for revitalizing parts of Alberta's natural landscapes in the coming years. It is the first variety of native grass adapted for seeding reclamation sites at higher elevations and was recently developed and released by the Alberta Environmental Centre in Vegreville. This slender wheatgrass variety was specially developed for the mountains and foothills of Alberta.

Currently, there are no native grass varieties commercially available to fulfill the demand for reclamation sites as a result of coal mining, oil and gas extraction, forestry, recreation, rangeland rehabilitation, and railway and road construction. It is expected that there will be heavy demand for this variety based on the number of inquiries already received by the Centre. AEC Highlander will be marketed by Pickseed Canada Inc. and will be available in limited quantities by fall 1993 and in commercial quantities by 1994.

AEC Highlander was extensively tested for five years at plains and mountain sites including Columbia Icefields, Sunshine Village and Mountain Park. The primary advantage of AEC Highlander is its ability to grow rapidly and produce mature seed in short growing seasons. It will allow the invasion of a reclaimed site by adjacent native plants, eventually providing cover similar to surrounding undisturbed areas.

AEC Highlander is a self-pollinated perennial bunch grass. It was derived from a single plant collected in the Crowsnest Pass region (elevation 2000 m) of southwestern Alberta in 1985. It was part of a collection of native grass plants from over 300 sites in the eastern slopes of the Rocky Mountains. Reclamation varieties of other native grass species from this collection will be released over the next few years.

The Alberta Environmental Centre, located west of Vegreville, is the province's major facility for applied environmental research, technology development and related services.

Background

The Alberta Environmental Centre is the province's major facility for applied environmental research, technology development and related services. It is one of Canada's first environmental research and service agencies to serve numerous government departments, industry and the public, while simultaneously integrating several scientific disciplines within its programs.

This concept of an integrated, interdepartmental facility to study and solve environmental problems was approved by the Government of Alberta in 1973, and the Centre was officially opened in June 1981. Since then, most of the environmental problems studied at the Centre have been those identified by departments and agencies of the Alberta government. In recent years, however, an increasing volume of work has been carried out in collaboration with private-sector firms and public-sector agencies located in Alberta, Canada and other countries. For administrative purposes, though, the Centre is an arm of Alberta Environmental Protection.

Based on the integrated-interdepartmental concept, the Centre was designed around three principal activities: analytical and diagnostic services; applied research; and technology development.

Facility

Much of the work at the Centre is conducted in laboratories and service buildings occupying 28,000 m^2. The complex is situated on a 300-h site that is sufficiently large to incorporate a separate incineration facility, a laboratory waste treatment system, wastewater storage lagoons, a completely isolated inhalation toxicology facility, three greenhouses and outdoor plots for field testing, crop protection and land reclamation projects. Domestic cattle and wild ungulate holding facilities complete the site.

Research Approach

A multidisciplinary team approach to research is used at the Centre because it is regarded as the most promising way to examine problems that are not limited to the boundaries of traditional scientific disciplines. Team leaders and participants are chosen from among scientific and technical staff, according to the expertise needed to solve particular problems. The composition of teams changes as the nature of the environmental problems changes.

Normally, a project results from a request by a client to solve an environmental problem. Much of the work carried out at the Centre is done for Alberta Environmental Protection, but the growing number of government and industry clients has caused the range of offered services to expand proportionately.

Typical Services

On a typical day at the Centre, the quality of air is tested, drinking water samples are analyzed, and the performance of municipal drinking water and industrial wastewater treatment plants is monitored. The results of these analyses are used by Alberta Environmental Protection to determine whether waste generators and treatment facilities are complying with licence-to-operate conditions and environmental protection regulations.

Also, a mobile water treatment plant allows researchers to test and develop improved systems for the treatment of drinking water and wastewater. In addition, investigators use special types of isotopes to monitor water movement in underground aquifers and within groundwater supplies.

Specialists provide diagnoses of insects, weeds, plant diseases, and cases of suspected chemical injury to crops and other vegetation. Advice on strategies to manage/correct pest problems are shared with farmers, gardeners and howeowners. Methods for controlling plant and animal pests are developed, including those using natural predators and other ecological approaches instead of chemical pesticides.

Centre staff study the effects on birds, fish, water and soil of chemical residues remaining after herbicides and insecticides have been applied. Toxicologists at the Centre examine the effects of various gases, liquids and other substances in animals.

Researchers develop grasses and other plant species that are suitable for planting on land that is being reclaimed after some human activity, such as coal mining or the laying of a pipeline, has been completed. Scientists are also acquiring knowledge about the chemical, physical and biological obstacles that must be overcome for the long-term success of land reclamation projects.

Garbage and industrial wastes are also being studied. Specialists use an incineration facility to study the best conditions for burning solid and liquid wastes while producing few emissions and waste streams. Also, they evaluate processes for solidifying and stabilizing wastes.

As might be expected, all this work has generated hundreds of technical reports, journal articles, manuals, extension materials and books. Also, Centre staff regularly respond to requests from the public for information and they frequently give seminars and workshops detailing their research activities.

Supporting all these activities are computing facilities, a library, clerical and secretarial services, and the skilled technical staff to assist the professional staff and maintain, repair and design machinery, instruments and other equipment.

For more information contact: Executive Director, Alberta Environmental Centre, Bag 4000, Vegreville, Alberta T9C 1T4. Telephone (403) 632-8211, FAX: (403) 632-8379.

Bird Records From Yukon Territory

The Canadian Wildlife Service is compiling a database of current and historical bird records for Yukon Territory. The database will be used to produce a publication, called "Birds of the Yukon" which will include species accounts and grid-style distribution maps for all Yukon species.

If you have visited the Yukon and kept bird notes, please send a copy of your notes to Pam Sinclair, CWS, Box 6010, Whitehorse, Yukon Y1A 5L7. Fairly exact locations of sightings are essential for mapping, which will be based on 1:50000 scale NTS mapsheets. In addition, any evidence of breeding (nests found, adults feeding young, young-of-the-year observed, etc.) would be very useful. All contributions will be acknowledged in the publication.

Rare and Endangered Species of the Castle Wilderness

Michael Gerrand and Dave Sheppard

Introduction

The frog does not drink up the pond in which he lives.
- Teton Sioux Proverb

We live in a world of rapidly increasing human population and ever accelerating human exploitation of the biosphere. It is estimated that at the present time between two and six thousand species become extinct each year as a result of deforestation alone. This extinction rate is ten times the rate that existed before the human species evolved (Wilson, 1989). Over the next 30 years, unless present trends are reversed, we can expect to lose at least 5-10% of all species on earth, and fully half over the next 50-100 years (Wilson, 1992).

In Canada, largely as a result of delayed human exploitation, the extinction rate is much lower than the world average. Even so, one in 40 of Canada's 1800 species of vertebrate animals is today either endangered or threatened (Caduto and Bruchac, 1991). In Alberta, much of the original biodiversity of the grassland and parkland regions has already been lost, though much can still be saved (Posey, 1992).

Though still largely in a wild state, the Castle Wilderness north of Waterton Lakes National Park in southwestern Alberta does not escape the global reality of accelerated habitat loss and species extinction. This area has seen the extirpation of the bison and the river otter, and has its share of rare and endangered species, any one of which could inadvertently be extirpated by an inappropriate development project or an uninformed management decision. These susceptible species, small in population and clinging tenuously to survival in what remains of a once larger ecosystem, are the subject of this report.

Background and Methodology

The conservation and recovery of threatened and endangerd species is a major focus in the management of biodiversity and the perpetuation of ecosystems in North America today. This focus began to take shape in tangible form as early as 1966 when the United States Endangered Species List, which led to the Endangered Species Act of 1973, was drafted. Today endangered species are further protected from international trade in endangered wildlife and wildlife products by the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

In Canada there is still no endangered species legislation. As a result, there is no consistent Canada-wide system for rating the status of rare and endangered species.

In 1976, the Federal-Provincial Wildlife Conference formed the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The mandate of this committee is to prepare status reports on Canadian species at risk. In its classification of endangered species, COSEWIC uses the following categories:

Extinct:	no individuals of the species left alive anywhere on earth.
Extirpated:	no longer exists in an area where it was once present.
Endangered:	species threatened with immediate extinction or extirpation.
Threatened:	species likely to become endangered if pressure from human or natual causes impinging on their population is not reversed.
Vulnerable:	species at risk because of low numbers or restricted range and therefore, although not in immediate danger, could be at any time.

We have followed the COSEWIC classification in rating the national and local status of Castle Wilderness animals. In addition, we have added the following categories:

Rare:	species whose populations are thinly-distributed, fragmented or localized but probably secure unless habitat loss occurs.
Watch:	Status of most of these species is poorly known but they appear to be uncommon and/or declining and should be evaluated. We also regard them as sensitive species, easily displaced by human activities.

The status of wildlife in Alberta has recently been rated by Alberta Fish and Wildlife (1991). Only terrestrial vertebrates are included in the Alberta report -- fish and plants are excluded. The report employs a colour-coded system, as follows:

Red:	These species are in serious trouble. Their populations are nonviable or at immediate risk of declining to nonviable levels in Alberta. They have, or will be considered for, designation as Endangered Species in Alberta.
Blue:	These species are also at risk, but the threats they face are less immediate. They are particularly vulnerable to noncyclical declines in population or habitat, or to reductions in provincial distribution.

Yellow: These are sensitive species that are not at risk. They may require special management to address concerns related to low natural populations, limited provincial distribution, or particular biological features (e.g., colonial nesting, narrow habitat requirements).

In our report we have followed this classification in ranking the Alberta-wide status of species found in the Castle Wilderness.

Because there are so many rare plant species in the Castle Wilderness, and because different rating systems have been used nationally and provincially for plants than for animals, we have chosen to divide our report into two parts.

Part I.

Rare and Endangered Animals of the Castle Wilderness

Key to tabular abbreviations: CW = Castle Wilderness status; AB = Alberta status; CDA = Canadian status; Ext = extirpated; End = endangered; Thr = threatened; Vul = vulnerable; Rar = rate; W = watch; R = red; B = blue; Y = yellow; - = unrated. Information on the status of vertebrate species has been taken from Alberta Forestry, Lands and Wildlife, 1991; Finch, 1992; Gibbard and Sheppard, 1992; Waterton Lakes National Park, 1989; and World Wildlife Fund, 1992.

Extirpated Species

As far as we know, there are no recently extinct species which formerly occupied the Castle Wilderness. However, at least two species have been extirpated.

Common Name	Scientific Name	Status		
		CW	AB	CDA
Plains bison	*Bison bison*	Ext	-	-
River otter	*Lutra canadensis*	Ext	B	-

We know of no recent records of river otter in the Castle area, and the species is assumed to be extirpated. The woodland caribou and the peregrine falcon may once have been present in the area in small numbers, but these occurrences are speculative.

Endangered Species

We have identified three endangered species in the Castle Wilderness.

Common	Scientific Name	Status		
		CW	AB	CDA
Gray wolf	*Canis lupus*	End	Y	-
Fisher	*Martes pennanti*	End	Y	-
Long-toed salamander	*Ambystoma macrodactylus*	End	R	-

The gray wolf is not an endangered species in Canada, but it is endangered in the contiguous United States, including the Crown of the Continent Ecosystem. After a long period of near-extirpation, wolf sightings have been increasing in recent years in southwestern Alberta. At least five wolves were seen in the Castle Wilderness in 1992, one of which was shot.

The fisher was probably extirpated from the Castle Wilderness in the early part of this century. In 1991, tracks were recorded by consulting biologists in the West Castle valley as part of the Environmental Impact Assessment for the proposed Westcastle Four Seasons Resort Development (HBT Agra 1992).

The long-toed salamander is on the provincial Red list and is known to breed in the vicinity of the proposed Westcastle Development.

According to Conant (1958), the northern leopard frog *(Rana pipiens)* may occur in ponds and streams of the Castle Wilderness, but this is unconfirmed. If it does occur, it is an endangered species and is on the provincial "red" list.

Threatened Species

Five species in the Castle Wilderness have threatened status.

Common Name	Scientific Name	Status		
		CW	AB	CDA
Grizzly Bear	Ursus arctos	Thr	B	Vul
Wandering shrew	Sorex vagrans	Thr	B	-
Long-tailed weasel	Mustela frenata	W	Y	Thr
Bull trout	Salvelinus confluentus	Thr	-	-
Westslope cutthroat trout	Salmo clarki lewisi	Thr	-	-

The grizzly bear is rated a threatened species in the contiguous United States under their Endangered Species Act. In southwestern Alberta, the grizzly suffers from similar and even greater pressures, is present only in low numbers, and is probably declining.

The wandering shrew is known in Alberta only from the West Castle valley, where it is threatened by the proposed Westcastle Four Seasons Development.

The long-tailed weasel is present in the Castle Wilderness, where its exact status is unknown. It is listed as threatened by COSEWIC, largely due to the decline of prairie populations.

The bull trout is disappearing from streams in the Castle area generally, and has disappeared entirely from Pincher Creek.

The native westslope cutthroat trout is also disappearing due to habitat loss, angling pressure, and hybridization with rainbow trout. Cutthroat trout are no longer present in the Drywood and Yarrow Creek watersheds. It is not know if any genetically-pure native cutthroat trout remain in the Castle Wilderness.

Vulnerable Species

Twelve species of animals are listed as vulnerable.

Common Name	Scientific Name	Status		
		CW	AB	CDA
Wolverine	*Gulo gulo*	Vul	B	Vul
Red-tailed chipmunk	*Eutamias ruficanudus*	Vul	B	-
Bobcat	*Lynx rufus*	Vul	B	-
Lynx	*Lynx lynx*	Vul	B	-
Cougar	*Felis concolor*	Vul	B	-
Mountain goat	*Oreamnos americanus*	Vul	B	-
Bald eagle	*Haliaeetus leaucocephalus*	Vul	B	-
Golden eagle	*Aquila chrysaetos*	Vul	Y	W
Cooper's hawk	*Accipiter cooperi*	Vul	B	Vul
Great gray owl	*Strix nebulosa*	Vul	B	Vul
Prairie falcon	*Falco mexicanus*	W	B	-
Spotted frog	*Rana pretios*	Vul	B	-

The exact status of the wolverine is unknown, but its habitat has been decreasing in recent years. If better information were available, it would likely be listed as threatened.

In Alberta, the red-tailed chipmunk is known only from Waterton Lakes National Park and the West Castle valley. The West Castle population is threatened by the proposed Westcastle Four Seasons Development.

Bald eagles are present in the area largely or entirely as migrants. Golden eagle numbers are thought to have declined over the last fifty years. The actual status of the Cooper's hawk and the great gray owl within the Castle Wilderness is unknown.

Rare Species

We have placed five species on the rare animal list because of the specialized and/or disjunct nature of their habitats. Their populations are believed to be healthy, but this status could change if habitat is altered.

Common Name	Scientific Name	Status		
		CW	AB	CDA
Badger	*Taxidea taxus*	Rar	Y	-
Pika	*Ochotona princeps*	Rar	Y	-
Water vole	*Arvicola richardsonei*	Rar	Y	-
Hoary marmot	*Marmota caligata*	Rar	-	-
White-tailed ptarmigan	*Lagopus leucurus*	Rar	-	-

Watch List (Sensitive or Declining Species)

We have placed 21 species on the Castle Wilderness watch list. These are species that are sensitive to human disturbance, including logging (many depend on old growth forest) and pollution. In some cases the population status of the species is unknown. Though not considered currently at risk, these species could be in jeopardy if present trends of habitat loss or population decline continue.

Common Name	Scientific Name	Status		
		CW	AB	CDA
Black bear	*Ursus americanus*	W	-	-
Elk	*Cervus elaphus*	W	-	-
Moose	*Alces alces*	W	Y	-
Bighorn sheep	*Ovis canadensis*	W	Y	-
Pine marten	*Martes americana*	W	-	-
Northern goshawk	*Accipiter gentilis*	W	Y	-
Western screech owl	*Otus asio*	W	Y	-
Northern pygmy owl	*Glaucidium gnoma*	W	-	-
Northern saw-whet owl	*Aegolius acadicus*	W	-	-
Pileated woodpecker	*Dryocopus pileatus*	W	Y	-
Black-backed woodpecker	*Picoides arcticus*	W	Y	-
N. three-toed woodpecker	*Picoides tridactylus*	W	Y	-
Black-headed grosbeak	*Pheucticus melanocephalus*	W	Y	-
Brewer's sparrow	*Spizella breweri*	W	B	-
Clark's nut-cracker	*Nucifraga columbiana*	W	Y	-
Olive-sided flycatcher	*Contopus borealis*	W	-	-
Trail's flycatcher	*Empidonax trailii*	W	-	-
Varied thrush	*Ixoreus naevius*	W	Y	-
Winter wren	*Troglodytes troglodytes*	W	Y	-
Calliope hummingbird	*Stellula calliope*	W	-	-
Harlequin duck	*Histrionicus histrionicus*	W	-	-
Wandering garter snake	*Thamnophis elegans vagrans*	W	Y	-
Northwestern toad	*Bufo boreas*	W	Y	-

Part II
Rare Vascular Plants of the Castle Wilderness

There is insufficient information on the relative abundance of rare plants in the Castle Wilderness to enable a classification of their endangered status. No plants from this area are currently listed by the Committee on the Status of Endangered Wildlife in Canada. By our count, 124 species of provincially rare plants occur in the Castle Wilderness. Forty of these are also nationally rare.

Argus and Pryer (1990), in their report on rate vascular plants in Canada, use a complex ranking system based on a one to five priority scale. Priority one (P1) plants have the narrowest distributions with very few known locations. These are the most imperilled of the rare plant species, and are at greatest risk to habitat change or alteration. Priority five (5) plants, on the other hand, although rare, are not greatly at risk. Although nationally restricted in distribution, they exhibit relatively abundant populations where they do occur.

The rare vascular plants of the Castle Wilderness are listed in the following table, nationally rare species first. National status is derived from Argus and Pryer, 1990; Fairbarns, 1986; and Waterton Lakes National Park, 1989. Alberta status is taken from Kuijt, 1982; Packer and Bradley, 1984. Rare species have five or fewer known locations in the province, while very rare have only one or two known locations. The latter is our own definition.

(Key: C = common; R = rare; VR = very rare; NR = not ranked by Argus and Pryer but considered nationally rare by other authorities; P1-P5 = rating of Argus and Pryer; - = unrated; CW = status in the Castle Wilderness; AB = status in Alberta; CDA = status in Canada.)

Common Name	Scientific Name	Status		
		CW	AB	CDA
Paradoxical grape fern	*Botrychium paradoxum*	VR	VR	P1
Dwarf alpine poppy	*Papaver pygmaeum*	VR	VR	P1
Geyer's wild onion	*Allium geyeri*	VR	VR	P2
Lyall's scorpion-weed	*Phacelia lyallii*	VR	VR	P2
Yellow paintbrush	*Castilleja cusickii*	VR	VR	P2
Dwarf fleabane	*Erigeron radicatus*	VR	VR	P2
Umbellate chickweed	*Stellaria umbellata*	R	R	P3
Yellow angelica	*Angelica dowsonii*	R	R	P3
Sandberg's wild parsley	*Lomatium sandbergii*	VR	VR	P3
Lyall's beardtongue	*Penstemon lyallii*	R	R	P3
Cushion Townsendia	*Townsendia condensata*	VR	VR	P3
Sedge	*Carex epapillosa*	VR	VR	P4
Geyer's sedge	*Carex geyeri*	VR	VR	P4
Payson's sedge	*Carex paysonis*	VR	VR	P4
Nevada rush	*Juncus nevadensis*	VR	VR	P4
Hitchcock's wood rush	*Luzula hitchcockii*	VR	VR	P4
Mariposa lily	*Calochortus apiculatus*	C-R	R	P4
Bear grass	*Xerophyllum tenax*	C-R	R	P4
Slender knotweed	*Polygonum engelmannii*	R	R	P4
Meadow chickweed	*Stellaria obtusa*	VR	VR	P4
Dense-leaved whitlow cress	*Draba densifolia*	VR	VR	P4
Buttercup	*Ranunculus verecundus*	R	R	P4
Mountain hollyhock	*Iliamna rivularis*	VR	VR	P4
Willowherb	*Epilobium glaberrimum*	VR	VR	P4
Sweet cicely	*Osmorhiza occidentalis*	R	R	P4
Blue beardtongue	*Penstemon albertinus*	R	R	P4
Two-leaved bedstraw	*Galium bifolium*	VR	VR	P4
Yellow alpine fleabane	*Erigeron ochroleucus*	R	R	P4
Oregon saxifrage	*Saxifraga oregona*	VR	VR	P5
Groundsmoke	*Gayophytum racemosum*	VR	VR	P5
Crested beardtongue	*Penstemon eriantherus*	R	R	P5
Long-leaved arnica	*Arnica longifolia*	R	R	P5
Marsh butterweed	*Senecio foetidus*	R	R	P5
Large-flowere ragwort	*Senecio megacephalus*	VR	VR	P5
Dwarf grape fern	*Botrychium simplex*	R	R	NR
Mountain bladder fern	*Cystoperis montana*	R	R	NR
Mountain lay slipper	*Cypripedium ontanum*	R	R	NR
Nuttall's sandwort	*Arenaria nuttallii*	R	R	N
Pine-sap	*Monotropa hypopitys*	R	R	NR
Pine drops	*Pterospora andromeda*	R	R	NR
Sitka club moss	*Lycopodium sitchense*	R	C	-
Wallace's stick moss	*Selaginella wallacei*	VR	VR	-
Lance-leaved grap fern	*Botrychium lanceolatum*	R	R	-
Maidenhair fern	*Addiantum pedatum*	VR	VR	-
Alpine lady fern	*Athyrium distentifolium*	VR	VR	-
Bracken fern	*Pteridium aquilinum*	R	R	-
Western larch	*Larix occidentalis*	VR	VR	-
Mountain hemlock	*Tsuga mertensiana*	VR	VR	-
Mountain brome	*Bromus vulgaris*	R	R	-
One-spike oatgrass	*Danthonia unispicata*	R	R	-
Slender hairgrass	*Deschampsiaelongata*	VR	VR	-
Bearded fescue	*Festuca subulata*	VR	VR	-
Tall manna grass	*Glyceria elata*	VR	-	
Melic grass	*Melica smithii*	VR	VR	-
Alaska onion grass	*Melica subulata*	R	R	-
Little rice grass	*Oryzopsis exitgua*	VR	VR	-
Bluegrass	*Poa stenantha*	VR	VR	-
Nodding triselum	*Trisetum cernuum*	VR	VR	-
Open sedge	*Carex aperta*	VR	VR	-
Sheep sedge	*Carex illota*	VR	VR	-
Kellogg's sedge	*Carex kelloggii*	VR	VR	-
Merten's sedge	*Carex mertensii*	VR	VR	-
Presl's sedge	*Carex preslii*	VR	VR	-
Broom sedge	*Carex scoparia*	VR	VR	-
Blister sedge	*Carex vesicaria*	VR	VR	-
Hooker's fairy-bells	*Disporum hookeri*	VR	VR	-
Slender bog orchid	*Habenaria saccata*	VR	VR	-
Alaska bog orchid	*Habenaria unalascensis*	R	R	-
Western twayblade	*Listera caurina*	R	R	-
Broad-lipped twayblade	*Listera convallarioides*	VR	VR	-
Booth willow	*Salix boothii*	R	R	-
Willow	*Salix hastata*	R	R	-
Least knotweed	*Polygonum minimum*	VR	VR	-
Slender-leaved spring beauty	*Montia linearis*	VR	VR	-
Mountain chickweed	*Stellaria crispa*	R	R	-
Long-stalked whitlow cress	*Draba longipes*	R	R	-
Douglas stonecrop	*Sedium stenopetlum*	VR	VR	-
Prairie rockstar	*Lithophragma glabra*	R	R	-
Small-flowered rockstar	*Lithophragma parviflora*	R	R	-
Mock orange	*Philadelphus lewisii*	VR	VR	-
Mountain gooseberry	*Ribes inerme*	R	R	-
Sticky current	*Ribes viscosissimum*	R	R	-
Merten's saxifrage	*Saxifraga mertensiana*	VR	VR	-

Common Name	Scientific Name	Status		
		CW	AB	CDA
Saxifrage	Saxifraga odontoloma	VR	VR	-
White suksdorffia	Suksdorffia ranunculifolia	VR	VR	-
Blue suksdorffia	Suksdorffia violacea	VR	VR	-
Large-flowered fringecup	Tellima grandiflora	VR	VR	-
Douglas hawthorn	Crataegus douglasii	R	R	-
Hairy cinquefoil	Potentilla villosa	R	R	-
Western mountain ash	Sorbus sitchensis	R	R	-
Pink meadowsweet	Spiraea densiflora	VR	VR	-
Milk vetch	Astragalus miser	R	R	-
Large-leaved lupine	Lupinus polyphyllus	VR	VR	-
Mountain lover	Pachystima myrsinites	VR	VR	-
Buckbrush	Ceanothus velutinus	R	R	-
Yellow mountain violet	Viola glabella	R	R	-
Slender-fruited willowherb	Epilobium leptocarpum	R	R	-
Thoroughwax	Bupleurum americanum	R	R	-
Blunt-fruited sweet cicely	Osmorhiza chilensis	R	R	-
Purple sweet cicely	Osmorhiza purpurea	R	R	-
Large wintergreen	Pyrola bracteata	VR	VR	-
Creeping wintergreen	Gaultheria humifusa	R	R	-
Glandular Labrador tea	*Ledum glandulosum*	R	R	-
Linanthus	*Linanthus septentrionalis*	R	R	-
Microsteris	*Microsteris gracilis*	VR	VR	-
Skunkweed	*Polemonium viscosum*	R	R	-
Waterleaf	*Hydrophylum capitatum*	R	R	-
Narrow-leaved scorpionweed	*Phacelia linearis*	R	R	-
Prairie lungwort	*Mertensia lanceolata*	R	R	-
Large-flowered lungwort	*Mertensia longiflora*	VR	VR	-
Rough red paint-brush	*Castilleja hispida*	R	R	-
Many-flowered monkeyflower	*Mimulus floribundus*	VR	VR	-
Yellow monkeyflower	*Mimulus guttatus*	R	R	-
Shrubby beardtongue	*Penstemon fruiticosus*	R	R	-
One-flowered broomrape	*Orobanche uniflora*	R	R	-
Red twinberry	*Lonicera utahensis*	R	R	-
Big sagebrush	*Artemisia tridentata*	VR	VR	-
Meadow aster	*Aster campestris*	R	R	-
Slender hawksbeard	*Crepis atrabarba*	R	R	-
Spreading fleabane	*Erigeron divergens*	VR	VR	-
Fleabane	*Erigeron pallens*	VR	VR	-
Purple alpine fleabane	*Erigeron purpuratus*	R	R	-
Tall cudweed	*Gnaphalium microcephalum*	VR	VR	-
Clammy cudweed	*Gnaphalium viscosum*	VR	VR	-
Nodding microseris	*Microseris nutans*	VR	VR	-

Summary

This report lists 25 species of rare, vulnerable, threatened, and endangered vertebrate animals that occur the the Castle Wilderness. Two others (bison and river otter) have been extirpated.

Three species are rated as endangered. These are the gray wolf, the fisher, and the long-toed salamander. Five species - grizzly bear, wandering shrew, long-tailed weasel, bull trout, and westslope cutthroat trout - are rated as threatened.

Invertebrate animals, including insects, have not been included in the report, due to a lack of information.

The endangered status of vascular plants could not be determined, due to a lack of comprehensive plant survey information for the Castle Wilderness and elsewhere. However, good information exists on the rarity of plant species in the general area, especially for Waterton Lakes National Park. In the Castle Wilderness, 124 species of provincially rare vascular plants are known or believed to occur, and 40 of these are nationally rare. The rarest are the dwarf alpine poppy, *Papaver pygmaeum,* and the paradoxical grape fern, *Botrychium paradoxum.*

Conclusion

In the Castle Wilderness at the northern end of the international Crown of the Continent Ecosystem, several species of animals are in trouble. The future of the grizzly bear, a threatened species, is in doubt. The gray wolf is in constant danger of extirpation. The fisher, believed extirpated, has only recently been discovered in the West Castle valley by biologists undertaking an Environmental Impact Assessment for a proposed four-seasons resort (HRT Agra, 1992). The bull trout and the native cutthroat trout are disappearing from our streams.

These and other indicator species are telling us that all is not well. They are telling us that we, as the dominant species, the stewards of this land, need to refocus our attention to the urgent matter at hand: the preservation of the biological diversity of our planet, our mountains, our community, our ecosystem. Each extinction is a sad commentary on our failed stewardship, on the wrongness of our exploitative system.

As species approach extinction or extirpation, there is often an urgent cry to save them and to reverse the trend - a very expensive task. There are not enough resources and energy to save every species one at a time. (Even saving one species such as the whooping crane is incredibly expensive; saving a hundred species would clearly be prohibitive.) The only sensible approach to the problem of extinction is to save the habitat and the ecosystems in which endangered species live. In south-western Alberta, where the land is well populated (even the high mountains are intensively used), this will require a solid commitment, not only to our own species, but to myriad others with which we share the ecosystem.

To maintain perspective we need to remember that, in this report, we have probably considered less then 1% of the species that inhabit the Castle Wilderness. The rest - the insects and other invertebrates, the algae, mosses and fungi, the bacteria and viruses - remain for the most part unstudied and undescribed, many no doubt of more importance to the ecosystem - in the cycling of soil nutrients for example - than grizzly bears and elk. Nevertheless, the grizzly is important as a symbol of the success of our stewardship and as an "umbrella" -

conserving sufficient habitat for the bear will go a long way toward ensuring that the rest of the ecosystem survives.

What is needed is the liberation of all the things that
support life - the air, the waters, the trees -
all things which support the sacred web of life.
- Akwesasne Notes

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How Many Birds in a Day?

Elizabeth Savoy

Waterton Lakes National Park, May 31st 1993, 5:30 a.m. The call of a Common Loon echoed across Cameron Lake and the team ticked off their first bird of the day. The loon was joined by the songs of both Ruby and Golden-crowned Kinglets, a Varied Thrush, a Dark-eyed Junco and a Northern Waterthrush. Stops along the Cameron Lake road reaped several rewards such as the Western Tanager, Orange-crowned Warbler and the Fox Sparrow. The team disregarded a black bear foraging by the side of the road - the search was on for a Winter Wren.

Three teams set out across Southern Alberta this day to see who could find the greatest number of bird species in a day. The Lethbridge Naturalists Society's Bird Study Group was holding a bird-a-thon to raise money for a viewing blind at the Elizabeth Hall Wetlands in Lethbridge. We were all surprised at the positive responses to our sponsoring pleas. To teams started in Waterton, the other in Lethbridge; all teams had to be back at the Helen Schuler Coulee Centre in Lethbridge by 10:00 p.m.

At the bottom of the Cameron Lake road,our team recognized another team's vehicle. We exchanged polite greetings and went our separate ways. After a quick jaunt through the Waterton townsite we reached Cameron Falls, where a pair of Dippers and two male Harlequin Ducks made an appearance. Vaux's Swifts and Violet-green Swallows were also spotted in the town. Before leaving the Park we saw a Black-headed Grosbeak, Lazuli Bunting, Marsh Wren, Cooper's Hawk, Osprey and the only Cedar Waxwings of the day. Our plan was to leave Waterton by 9:00 a.m. - we were an hour behind schedule, but already had an impressive 72 species.

Driving madly (but legally), we headed east. Police Outpost Wetlands and Police Lake were a disappointment - no Sandhill Cranes. Taking Highway 501 through Kimball and towards Milk River we were able to tick off most of the resident waterfowl, including a Pied-billed Grebe. We hit a jackpot at a shallow slough east of Kimball - both Trumpeter Swans and Sandhill Cranes!

It's hard to imagine, but it was afternoon before we were able to tick off a Horned Lark and Western Meadowlark. Even more surprising was having to wait until 2:30 p.m. to find a Rock Dove. The grasslands around Milk River presented a Ferruginous Hawk, Lark Bunting, Braird's Sparrow and Chestnut-collared Longspur.

Next stop, Writing-on-Stone Provincial Park. Surely we could pick up a Turkey Vulture or a Prairie Falcon? We saw neither, but were compensated with a Yellow-breasted Chat and a Golden Eagle. Exhausted and hungry, we stopped in the park for a quick nap, some sandwiches and a cup of rather tepid coffee. A Merlin was nesting above our rest stop.

We headed towards Stirling Lake, but only two new species were found here - Double-crested Cormorant and Forster's Tern. The lake seemed to be too high this year for Black-necked Stilts and White-faced Ibis, pity.

We had yet to spot a Gray Partridge. Driving slowly past farmsteads, we carefully scanned hedges and ditches, but this common species managed to elude us. A wild Chukar chase proved fruitless. Two of our team members had spent considerable time staking out particular species before the big day, so our next stop was near Raymond for a pair of Bobolinks.

Back in Lethbridge, and a quick trip to a backyard where Blue Jays were known to be nesting. The home owners were in their yard, so an explanation was in order as to why four scruffy birdwatchers were prowling around their spruce tree. They seemed amused.

At the Lethbridge Nature Reserve we again bumped into another of the teams. They seemed rather frantic - either they had drunk too much coffee, had seen a lot of species or had gained a second wind. Perhaps all three - again their lips were sealed. We searched the nature centre for the Lark Sparrow which sings every day from the same perch (no luck today).

Last stop Keho Lake; we went to see the Piping Plovers. Several peeps escaped unidentified. Our last species was a surprise for late May - a Snow Goose resting on the shoreline.

Just before ten o'clock we pulled in to the nature centre, anxiously awaiting results from the others. We were happy with our total of 143 (and no speeding tickets). The other team that had travelled far and wide had reached 137 species and the team that stayed near Lethbridge reached 100. One of the other teams got a "wren grand slam" - Rock, House, Winter and Marsh. They also added a new species to the Waterton checklist, the Eastern Phoebe. We saw 165 bird species and raised more than $800.00 towards the wildlife viewing blind. By the way, the next day the Lark Sparrow resumed his singing outside the nature centre!

The bird-a-thon was an exhilarating and exhausting experience. It would be fun to try it again some time - could we do anything differently and find even more species? Perhaps in a year or so...

Bird-a-thon Participants:
Doug and Teresa Dolman, Andrew Hurly, Elizabeth Savoy, Jay VanderGaast, Ross Munro, Linda Cerney, Laure Neish, Witold Gierulski, Doug Walker, Bob and Shirley Anderson.

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Valley Of The Falcons

Dick Dekker

Placid and nowhere wider than a hundred metres or so, the Red Deer River is not a mighty stream, but its valley is magnificent. The sun-facing slope is open and arid. In spring, the colours range from the gold of dry grass to the silver of sage and the pale mauve of wild crocus. Groves of aspen poplar are flushed with the delicate green of budding leaves. On the other side of the valley, the river is walled by tall brooding spruces that shade cliffs of ochre sandstone, some deeply eroded and sculptured into hoodoos and buttresses, others a steep rubble of shale and crumbling boulders.

In the early sixties, two species of large falcons nested in the valley: the prairie falcon and its celebrated cousin the peregrine. While I was very interested in the relationship of the two, it was the peregrine that I had come to find. I saw my first one in May of 1960 as it sailed in with a challenging cry and landed on a pinnacle streaked with white excrement, proof that the falcon had used it before. The bird's smallish size marked it as a male, a tiercel. His dorsal side was grey-blue, breast and throat were nearly pure white. He looked about with quick turns of his dark head, his eyes not focusing on the scenic beauty of his surroundings, but on the gulls, terns, swallows and blackbirds that darted over the water below and in the blue and white sky above.

He called again, his staccato voice reverberating against the cliff. Hurriedly, he dropped off his perch. With quick sculling wingbeats he rose over the river and veered sharply back to the crest of the valley, where a Cooper's hawk flitted above the poplar. Before the hawk was lost between trees, the tiercel had time for one threatening stoop. Watching for the hawk's return, the falcon soared over the valley, then played a game with two red-tailed hawks, which also claimed this area as their territory. Together they circled for a long time, until the peregrine wafted high into the clouds and was gone.

In ensuing days, I was hoping to find two birds at the cliff, a pair, but no female falcon ever showed up. The tiercel often alighted on a certain ledge and rooted around in a depression, suggesting that this was the spot he had wanted to show to a mate. In previous years, that spot might have served as a nest scrape, but from now on it was to stay unoccupied. During the course of spring and early summer, the bachelor tiercel lost interest in his territory, spending less and less time there, and eventually he disappeared.

Fortunately, elsewhere in the valley I found four cliffs which were home to pairs of peregrines. The birds sat on their favourite perches like exquisite statuettes. Thinking back on them now, they seemed exotic, almost too beautiful to last. Despite all their speed and haughty self-sufficiency, these falcons proved too fragile to survive in the valley.

When disturbed at the nest, a pair of peregrines flies back and forth and keeps up an unnerving tumult. It is not very rewarding to watch a bird that is evidently so ill-pleased with one's attention. On only two occasions have I climbed a nesting cliff to take a look at eggs or young. The last time, the female sat tight and refused to join the screaming tiercel flying above. When I finally flushed the brooding falcon, one of her two newly-hatched young, which she had been sheltering under her breast, was accidentally flung onto the ledge and almost dropped over the edge.

After that close call, I left the eyries alone and made it a practice to watch from the other side of the river. The falcons were not at all disturbed when I sat quietly in the shade of the woods lining the opposite bank. In most cases, the actual nest sites were screened by small spruce trees or hidden behind protruding rock. But one of them was situated so low, a mere four metres above the water, that it was possible to observe the brooding bird from the steep bank across the river. Another pair had adopted a nest of sticks which had long ago been the home of a ferruginous hawk. The head of the sitting falcon could be seen from my vantage point.

The peregine's relationship with the prairie falcon appeared to be one of mutual tolerance. A pair of prairies nested less than a kilometre upstream from a peregrine residence. I never noticed any friction between them. Apparently these neighbours knew each other, and the border between their respective properties was as well-defined and inviolate as a fence in suburbia. But whenever a strange prairie falcon came into view downstream from the peregrines, the latter always gave chase.

Apart from these isolated acts of territorial defence, the peregrines rarely bothered other birds. To my regret, I never saw them chase prey in the valley. They did not hunt there because too many areas were out of bounds -- the territories of other falcons. Besides, the plains flanking the valley offered boundless hunting grounds. Undulating fields, pastures and woodlots alternated to the far horizon, with small lakes and

Peregrines became extirpated along the Red Deer River by late 1960s. Photo: Dick Dekker

sloughs tucked away in the depressions. To the soaring peregrine, these waterholes must have looked like shining beacons, alive with small birds, targets for the stooping hunter.

How fervently would I have liked to accompany the tiercel when he left on his foraging flights! I kept him in the binoculars for as long as possible. While cawing crows took cover in trees, he flew to the rim of the valley where he started to soar, gaining great altitude. No more than a speck against the billowing clouds of early summer, he drifted away and dissolved into the distance.

An hour or more later, he sailed in with a small prey in his talons, which was taken over by the female in mid-air. She ate it on a perch, while the tiercel took his turn brooding the eggs.

During the long hours of waiting and watching near the peregrine eyries, my thoughts often dwelled on the perils that falcons and other birds of prey were facing in the western world. At that time, peregrine populations were dwindling in North America as well as in Europe. As breeding birds they were extirpated in the eastern provinces and states, poisoned by toxic chemicals. Residues of mercury and DDT used in agriculture and forestry had been found in the tissues and eggs of a wide range of birds, some dying directly, while in others reproduction was affected. Predators were especially vulnerable, as the poisons turned the process of natural selection against them; those individuals of the prey species that carried the heaviest load of pesticides and were on the point of dying were the first to be caught by the hawk, in which the poisons accumulated.

I had every reason to be fearful about the continued existence of the peregrines in the beautiful "Valley of the Falcons." Year after year, there were fewer nests -- eventually there would be none at all. But their gradual disappearance did not seem to have been linked to sterility. Even the last pairs laid fertile eggs, but the young rarely fledged from the nest. Often, the cause was direct intervention by humans.

People were frequenting the valley in growing numbers for a variety of purposes. A dozen or more canoe parties floated by during the weekends. Some landed and camped near the falcon cliffs. They and other recreationists, such as rock climbers, picnickers and fishermen, could involuntarily keep a falcon off the nest for hours, in some cases causing desertion or chilling of eggs and chicks. Vandals armed with rifles used the falcons as targets. Young peregrines, just before gaining independence, are very noisy birds, always urging their parents to bring food. As their loud cries can be heard from afar, they make themselves conspicuous to anyone approaching the cliff. The habit of peregrines to nest on high river banks exposes them to peril. While forest-dwelling raptors raise their offspring in the seclusion of woods, comparatively safe from discovery by humans, peregrines invite attention, especially from those who are looking for them, such as petkeepers and some falconers. They came to be valley for four or five years in succession and stole an unknown number of nestlings, including the last broods.

During the mid-1960s, more and more eyries in the valley remained empty. When only one bird turned up at a traditional nesting site in spring, the cliff was usually deserted the year after. First to go were sites adjacent to bridges, picnic spots and popular fishing holes; those lasting longest were along stretches of river where fewer people ventured. The process of extirpation was gradual and appeared complete by 1967.

From an increasingly insecure breeding area, the peregrines of the valley were migrating to equally insecure and polluted wintering grounds. Immature birds are trusting and ignorant of men and guns. Whenever I am approached by young birds, sailing straight overhead, their large eyes looking fearlessly into mine, my delight is mixed with concern. Unlike other raptors that hunt in open country, peregrines concentrate on the relatively narrow strip of land bordering lakes and water courses, where gun density is highest. Their curiosity brings them over waterfowl hunters crouching in the reeds, or they are attracted by the decoys. The post-war increase in shooters must have meant a subsequent increase in shot peregrines, just as the popularization of falconry resulted in an increase of captured birds. The rate of recovery of banded falcons serves as an indicator of the perilous times that young birds face during their first year; their mortality rate is about seven in ten!

Considering the various hazards to which the peregrines of the valley were subjected, it is clear that they would have been hard-pressed to survive, even if pesticides had not played their insidious role at all. As the total impact of all limiting factors grew, the birds hurried into oblivion, leaving no trace. Only their former haunts, the cliffs, remained, but it was as if the falcons themselves had never been there.

A curious phenomenon during the extirpation of peregrines in the valley was the population expansion of prairie falcons. Soon after peregrine cliffs became vacant, single prairies moved in. Most were immature birds that used the site only to roost, but in following years, pairs established themselves and set up thriving households. This succession of one species of falcon to another was consistent with the trend in parts of the United States. In the book *Peregrine Populations*, that documents the decline of the species, M.W. Nelson reviews the status of the peregrine in the American west and suggests that the most plausible explanation for its early and gradual disppearance was a change in climate. Since 1870, rising average temperatures and decreasing precipitation resulted in the drying up of lakes and caused a reduction in habitat and food supply for the peregrine. Prairie falcons, which are well adapted to semi-arid conditions, took over where peregrines left off. This change took place in the Okanagan Lake area of British Columbia after marshes were drained for agriculture in the first decades of this century, long before pesticides came into widespread use.

The country adjacent to the "Valley of the Falcons" had been subject to extensive manipulation and change in recent history. The melting of snow and evaporation of rainfall, no longer retarded by forest cover, was accelerated. Run-off was carried away spasmodically in streams and creeks, their continuous flow much reduced. Ponds and sloughs dried up. Longtime residents contended that the numbers of waterfowl were a fraction of what they were in the old days. Changes in farming methods had also left less room for partridges and feral pigeons. The peregrine's prey base seemed much reduced.

The fact that prairie falcons thrived in the valley at a time when peregrines were on the way out, points to the possibility of inter-specific competition. Had the

After Peregrines stopped breeding along the Red Deer River, Prairie Falcons became more common and occupied former Peregrine nesting cliffs. Along a three km stretch near Joffre, that had two nests of each species in 1960, there were four pairs of Prairies in 1992.

Photo: Kay Hodges

prairie falcon perhaps actively and aggressively pushed its cousin out? As mentioned before, I rarely noticed friction between the two species. It is generally believed that falcon eyries are established by tradition, and that applied without exception in the valley; certain cliffs were the domain of peregrines, year after year, others the undisputed territory of prairies. Only once, in the final stage of the peregrine's extirpation, did I witness a puzzling fight which seemed to contradict other observations.

It was the middle of April and the river ran blue and rippling past mud-covered slabs of candled ice piled high on the banks. Occasionally, part of the drab chunks collapsed into crystalline fragments with a cheerful tinkling sound. The peregrines had just returned from their winter quarters, while prairie falcons had been around for some time. On a crescent-shaped cliff, three prairies, a male and two females, were sitting near the nest ledges that for years had been the property of a pair of peregrines. Only one of the latter, a beautiful grey-blue tiercel, had turned up that spring. He frequented the lower end of the cliff, and seemed unable to drive off the imposters although he tried hard. The brown falcons appeared to ignore him. One of the females had several tail feathers missing, perhaps knocked out by the aggressive peregrine, which made lightning quick passes at her as soon as she flew. The prairie rolled over on her back, presenting talons, which the attacker avoided at a hair's breadth. When resting on the cliff, the prairies were not safe either, as the peregrine dived from above, concealing his approach behind trees and rock outcrops. The threatened bird jumped up at the last moment and turned upside-down, stretching its legs like a baseball player reaching up to catch a high ball. The confrontation took place in silence but looked deadly serious. A week later, when I visited the cliff again, the peregrine was gone and a pair of prairies was firmly established at the site.

A number of questions remain. Why had it been a one-sided fight in which the prairies had played only a defensive role? Was it an indication of their weak moral position? Did they know that this cliff was not rightfully theirs? Or were they afraid of their hostile cousin?

The fight did provide an opportunity to compare their respective powers of flight. The peregrine appeared vastly superior, but other observers report differently. Some have seen prairie falcons drive peregrines out of the sky. Victory may depend on moral rights. The bird that feels secure is the one that dominates. The intruder yields.

Often, prairie falcons make a rather sluggish impression when flying around the nest site, their wingbeats slow and shallow. But they strike a different picture when in pursuit of prey or when marking out territory with competitors. One spring day, two neighbouring couples chased each other up and down the valley. One of the tiercels, a strikingly pale individual, was faster than the other. As far as speed was concerned, he would have been a match for any peregrine. He was an accomplished hunter of avian prey; the talus slope below his eyrie was littered with the remains of meadowlarks, waxwings and other small birds.

His flying powers may have saved his life the day a shotgun-toting vandal entered the valley and blasted the nests of the two pairs of prairie falcons. At one site, both adults were shot and four youngsters starved to death. At the other nest, I found the remains of the female and three pellet-ridden young, but the pale tiercel was coursing high overhead, swiftly and silently. He alone had survived the carnage. Ten falcons lay dead. I felt a deep sense of shame as I watched the tiercel go. He winged to the rim of the valley, soared to the clouds and was gone.

(Abridged from chapter 15 in "Wild Hunters" by the same author, published in 1985.)

Footnote

In 1992, the Alberta Fish and Wildlife Services began a five-year program of "hacking out" captive-bred peregrines at three former cliff nesting sites along the Red Deer and Bow Rivers. (Yes, resident prairie falcons had to be discouraged!) Similar releases of captive-raised peregrines have been very successful at boosting wild populations in various regions of the USA and Europe. Past releases from buildings in Edmonton have led to the establishment of breeding pairs in our major cities. The current mass releases in rural Alberta (40 birds per year, which is the average production of 20 healthy wild pairs) are expected to bring back the species as a cliff nester in more natural settings. Last year's hacking program has already resulted in the return of at least one young bird that has teamed up with an adult male released ten years ago near Rosebud. It will be a great day indeed when a pair of adults will once again occupy one of the former eyrie cliffs in the "Valley of the Falcons!"

Naturalists are urged to keep an eye out for peregrines in central Alberta from June to August. For further information on the release program, please contact Petra Rowell, peregrine coordinator, Alberta Fish and Wildlife Services, O.S. Longman Building, 6909 - 116 Street, Edmonton T6H 4P2. Telephone 422-9535.

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The *Colias alexandra* complex in Alberta

Norbert G. Kondla

Introduction

The *Colias alexandra* complex consists of butterfly populations that are widely distributed in western North America. A substantial literature has developed on this insect and the various taxa that have been treated as part of this complex have been the subject of 'taxonomic football'. The purpose of this paper is to review what has been published about this complex in Alberta, describe the situation that actually exists in Alberta and present an argument for recognizing *Colias alexandra* and *Colias christina* as distinct species. The name *Colias alexandra* is used here for expediency.

Historical Taxonomy Summary

The taxa relevant to Alberta were described by W.H. Edwards in 1863 and 1872, Klots in 1935 and Bowman in 1942. The taxon *alexandra* (Edwards 1863a) was described from material collected in the region west of Denver, Colorado (Brown 1973). Later that year (Edwards 1863b), *Colias christina* was described as a new species with type material from "the portage of the Slave River". Kondla (in press) clarifies this type locality as being the vicinity of Mountain Rapids, Slave River, Alberta. Edwards (1872) introduced the name *astraea* as a new species based on a single male collected near Yellowstone Lake. Ferris (1992) viewed it as a hybrid situation, while Miller and Brown (1981) treated it as a synonym for *eurytheme*. I side with Hovanitz (1943) and Masters (1970) in treating it as a synonym for *C. christina.*

Except for a listing as a subspecies of *C. occidentalis* (McHenry 1963), the name *alexandra* has survived the attention of various writers essentially unmolested. The synonym provided by Ferris (1988) shows that fate was not as kind to the other taxa. It did not take long for Strecker to align *christina* with *pelidne.* In 1978 Skinner moved *christina* back to species status; where it remained until the early 1960, when McHenry associated it with *C. occidentalis* and dos Passos (1964) shifted *christina* to a subspecies of *alexandra. Astraea* survived as a species in the literature until 1898 when Skinner placed it as a subspecies of *christina.* In 1949 Holland reverted to species status for *astraea.* In the 1960s *astraea* was variously placed as a subspecies of *occidentalis, scudderi* and *alexandra.* Krauthii fared better. It was not tinkered with for some 20-odd years, when it was moved to a subspecies of *occidentalis* and then *alexandra.*

The mass migration of *christina, astraea* and *krauthii* to their status as subspecies of *alexandra* appears to originate from the treatment of Ehrlich (1961). dos Passos (1964) made these assignments explicit. I have been unable to find any published arguments or data to support this arrangement.

We are left with a situation where the conventional wisdom places taxa relevant to Alberta in the species *Colias alexandra.*

Characteristics of the Taxa

Additional murkiness and confusion confronts lepidopterists attempting to use the literature to identify and attach names to Alberta specimens. In random order, here is a smattering of what one finds when try to attach description to the names *alexandra, christina* and *astraea:*

alexandra

* Ferris (1973) - yellow (concolorous with the ground color) dorsal spots on the dorsal surface of the secondaries in the males,
* Pyle (1981) - some northern populations are orange; forewing yellow fringed; brighter yellow spot in hindwing cell; narrow black forewing yellow fringed; brighter yellow spot in hindwing cell; narrow black forewing and hindwing border; unrimmed cell spot on ventral hindwing; female yellow or white; refers Alberta populations to 'yellow populations'; wingspan 3.8 to 4.8 cm,
* Royer 1988) - ventral hindwing with much reduced discal spot (always poorly outlined); narrow dorsal borders; females usually have no dorsal hindwing border at all; white females occur; 4 - 5.5 cm wingspan,
* Ferris and Brown (1981) - male bright lemon yellow and female warmer yellow; ventral hindwing dusted with greenish gray scales; ventral hindwing discal spot unrimmed and usually quite small; white females occur in some colonies,
* Scott (1986) - ventral hindwing is grayish with a silver spot lacking a rim; fringes yellow; wings yellow.

christina

- Howe (1975) - presumably all orange but cannot be sure,
- Scott (1986) - orange on outer half of dorsal hindwing and outer 2/3 of dorsal forewing, ventral hindwing often has submarginal sports and rarely a central satellite spot,
- Hooper (1973) - females more yellow and some of them albinistic, their hindwings almost or entirely lacking black margins; males orange above with a wide band of sulphur yellow across the base of each wing; silver spot in middle of hindwing beneath,
- Masters (1975) - males extremely regular in appearance while females are extremely variable; 36 females from near the type locality were roughly 1/3 orange, 1/3 yellow, 1/3 white; female black bands absent to complete,

astraea

- Ferris and Brown (1981) - males vary from warm yellow though orange and yellow to orange with a small amount of yellow basally; orange dorsal hindwing discal spot; females vary from pure white to overwashed with prink or orange,
- McDunnough (1922) - white females; ventral hindwing discal spot not entirely constant, can be single or double,
- Gerould (1922) - extreme variability in females; "most bewildering variety of colors", "wonderfully variable species",
- Scott (1986) - the description given under *christina* is applied to Alberta in total,

For specific Alberta locations, here is what has been written:

- Masters (1975) - "A series of 36 males and 36 females of topotypical northern Alberta *Colias christina* (at Carnegie Museum) displayed slightly smaller size. Alberta males had a median forewing length of 24 mm, with the average slightly more than 24 mm; the range was between 22 and 27 mm. Alberta females had a median forewing length of 26 mm, with the average being slightly less than 26 mm; the range was between 19 and 29 mm; of the Alberta sample of nominate *christina*, only 27.8% of 36 females were orange, while 30.6% were yellow and 41.8% were white; ...the Alberta sample of 36 females contained 19.4% with immaculate wings, 44.4% with apex bands only, 22.2% with outer bands only and 13.4% with complete bands.
- Hovanitz (1950) - provided data on the prevalence of white vs. yellow/orange females in samples from various Alberta localities, as follows:

Location	**Yellow/orange**	**white**	**total**	**% white**
Ft. Smith-Fitzgerald	73	0	73	0
Pocahontas, 1948	8	21	29	72.4
Pocahontas, 1947	18	24	42	57.1
Mountains (unspecified)	3	13	16	81.3
Banff, Alberta	66	39	105	37.1
Calgary	25	20	45	44.4
Calgary, 1948	1	1	2	
Macleod Junction		1	1	
Didsbury	14	12	26	46.2
Waterton Lakes	4	2	6	33.3
Laggan[Lake Louise]	23	13	36	36.1

- Ferris (1988) - "...blend zone areas where all phenotypes can be collected in the same meadow (such as the Kananaskis Forest region south of Banff..."; referring to *astraea*, "This phenotype occurs in southern Alberta (in the foothills west of Calgary and north to the Banff region) ..."; includes a map showing *alexandra* complex as being absent from much of NE Alberta (including the type locality of *christina*),
- Hovanitz (1965) - "Populations ... from the north and east of [Waterton Lakes area] are generally orange or orange-yellow in the male.";
- Wolley Dod (1901) - referring to the area around Calgary, "...scarcely any two (series of 30) even nearly alike in either color or markings, much variation in male border.".

Many reasonable people look at such inconsistent and contradictory descriptive material and supporting illustrations and derive, the following conclusions: males are yellow or orange or something in between; females are white or yellow or orange or some combination thereof; the black wing borders are narrow or wide; populations are variable in appearance or they are not; the hindwing underside may or may not have submarginal spots; the ventral hindwing dorsal spot may have a rim or it may not; the dorsal hindwing discal spot may be orange or it may not; the ventral hindwing discal spot may be silver or white and it may or may not have a satellite spot; etc.

Curious indeed! One could suppose that various authors are describing different species rather than a single species. Using the existing literature on what appearance (phenotype) is associated with various names; one would be successful if they attached the name *alexandra* to a yellow male, flipped a coin and called yellow/orange or mostly orange male *astraea, christina* or *krauthii,* and threw a planning dart at a female and called it a *Colias* species unknown.

Fortunately all is not lost. Both species and subspecies names usually have a spatial (geographical) dimension and a phenotypic (appearance) dimension. That is to say, by knowing where you caught, photographed or saw a critter; you can eliminate names that have a traditional geographic definition remote from the record under consideration. For example, a bug that looks like *krauthii* caught in southwestern Alberta obviously is not *krauthii* since this name is spatially defined as referring to bugs in the Black Hills of South Dakota. You can feel safe in knowing that a *Colias* from SW Alberta with at least some orange on it is probably *astraea* - unless of course it is *eurytheme* or *canadensis* or *meadii.*

Confused and misled? Of course! This statement is not a reflection on the work of the many people who have researched the *alexandra* complex. It is an example of biological and taxonomic research at work. Field work, measurements, descriptions, publication of data, publication of opinions and speculation to foster more data collection, interpretations based on differing concepts and researcher backgrounds, conflicting interpretations based on differing data sets, analytical techniques and spotty data sets-the list of reasons for disparate statements goes on and on.

A Local View of the Alberta Situation

I became suspicious about the reported status of the *Colias alexandra* complex in 1978 when I caught a specimen of *Colias alexandra* near Standard. At that time *alexandra* was unreported in the literature. The authoritative treatment of the day (Ferris 1973) clearly indicated that I should have caught *christina* but the names *astraea, alexandra* or *krauthii*, may also apply. With a bit of additional field research around the province it soon became obvious that reality and the literature didn't mesh.

My personal work in Alberta over a 20 year period was supplemented by an exhaustive literature search that has yielded close to 400 references on Alberta butterflies and also by data collected by others. Particularly significant data have been provided by C.D. Bird, G. Hilchie, E.M. Pike, H. Pinel, S. Shigematsu and F.A.H. Sperling. The complete database from which information was used represents contributions from nearly 300 individuals.

Regardless of what names will be shown to be correct by further research; there definitely appear to be two distinct species in the province. Figure 1 shows the distribution I have been able to document for *C. alexandra* and Figure 2 shows the situation for *C. christina.*

By comparing these distribution maps with a map of ecoregions (Strong and Leggatt 1981) it is immediately clear that *alexandra* is essentially a prairie grassland insect and that *christina* is essentially a woodland insect. From a distribution and geography perspective this reality suggests (and field work confirms) that there is in fact no broad band of intergradation, zone of intergradation or blend zone region as reported in the literature. This macro-scale forest and grassland distinction also holds up on a site basis. Most of the prairie occurrences of *christina* and *astraea* phenotypes are places where forest and grassland habitats are in juxtaposition.

The phenology (time of adult flight) of these two species is very interesting. The collective data set was examined from the perspective of stations and abundance. A station is defined as a report of butterfly occurrence at a single place on a single day. Abundance is synonymous with specimen count. Both station frequency and total abundance was plotted against phenology units for each month of the flight season. A phenology unit is defined as early, mid- or late month as follows: early - days 1 - 10, mid - days 11 - 20, late - days 21 - 31. Since butterfly phenology is known to vary with latitude and altitude the data set for *christina* was stratified according to the following scheme to account for regional differences: prairies, aspen parkland, boreal forest, southern mountains, northern mountains. The Bow River valley was used as the northern terminus of the southern mountains region.

Colias alexandra extreme flight dates are 13 May and 1 September. The data shows a very pronounced bimodal pattern consistent with a bivoltine (two brooded) butterfly. In fact the break between broods is more substantial than illustrated by graphed data. No records of this species are available between 3 July and 23 July.

In contrast the smaller *christina* data set shows a clear unimodal pattern consistent with a univoltine (single brooded) butterfly. Individuals of these taxa peak during the time window (mid-July) when *alexandra* is not known to fly. The small boreal forest *christina* data set also indicates a univoltine situation but with a peak flight in early July. The much more substantive aspen parkland sample again indicates a univoltine creature with a pronounced peak flight in mid-July.

The very substantial samples from the southern mountains and the northern mountains are congruent and show that *christina* is univoltine here as well. Peak flights are in mid-July. The abundance data also suggest that the butterfly is more abundant (where it occurs) in the northern mountains than it is in the southern mountains. This is in agreement with my own qualitative field observations. Extreme early and late flight dates for *christina* in the province are 10 May and 26 September.

Table 1 presents the readily observable differences between the taxa *alexandra* and *christina* (including *astraea*-like phenotypes) in Alberta. It does not include less observable differences requiring specialized equipment for scrutiny nor differences in immature stages.

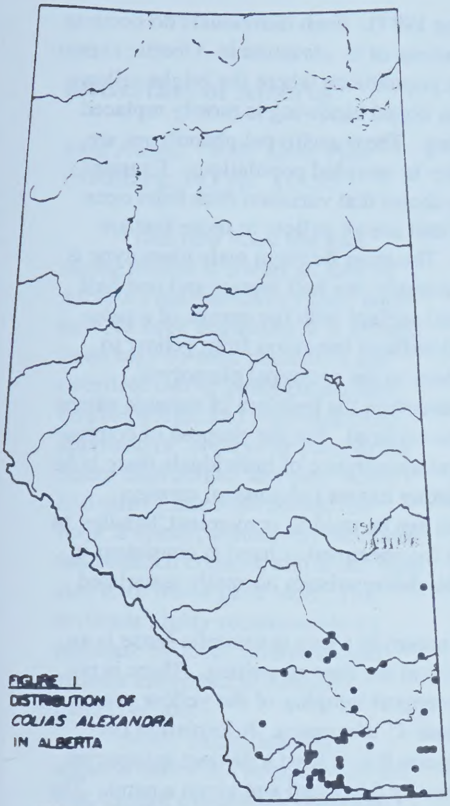

FIGURE 1
DISTRIBUTION OF
COLIAS ALEXANDRA
IN ALBERTA

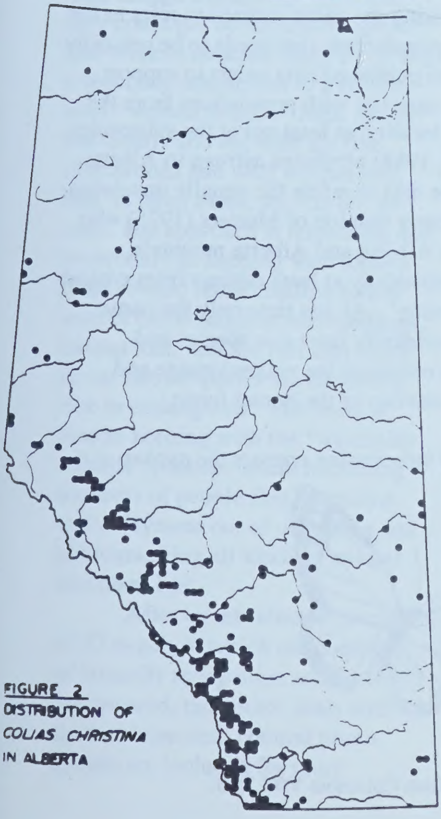

FIGURE 2
DISTRIBUTION OF
COLIAS CHRISTINA
IN ALBERTA

Table 1. Comparison of *Colias christina* and *C. alexandra* in Alberta.

Colias christina	Colias alexandra
• males variable but usually extensive orange areas on dorsal surface in at least 99% of individuals	• males with no orange areas on dorsal surface, yellow except for black forewing discal spot and marginal band
• male dorsal yellow areas of a lemon yellow hue	• males with dorsal cold yellow hue
• male ventral hindwing mostly yellow in boreal region, mostly greenish elsewhere	• male ventral hindwing greyish green
• ventral hindwing discal spot larger and with red rim, frequent satellite spot in north	• ventral hindwing discal spot smaller and does not have a red rim, no satellite spot
• frequent ventral submarginal spots in boreal populations (especially in males)	• no ventral submarginal spots
• dorsal hindwing with large orange discal spot	• dorsal hindwing without a discal spot, appearance of small pale spot is optical illusion due to ventral hindwing spot
• wing fringes mostly pink	• wing fringes yellow
• males larger, FW length mostly 25-27 mm	• males smaller, FW length mostly 22-23 mm
• male dorsal FW black border wider, generally 3.5 mm	• male dorsal FW black border generally narrower, 2 mm
• females extremely variable in size, color (yellow, orange, white or any combination thereof), amount of black dorsal marginal scaling	• females consistent in size, 99% white, minimal black dorsal marginal scaling
• antennae pink	• antennae pale buff
• dorsal forwing black band with yellow-orange overscaling; makes band look gray in fresh individuals	• dorsal forwing black band without colored overscaling
• univoltine	• bivoltine
• found in boreal forest, mountains and some fescue prairie areas	• found in prairie grasslands and some dry foothills grasslands

These differences are more dramatic than the differences between, for example, *C. pelidne* and *C. philodice*. Given the distributional, phenotypic, ecological and phenological differences between these taxa, it is reasonable to conclude that they are in fact separate and distinct species. Both taxa were originally described as distinct species and various literature that treats them as one species does not provide solid support for such treatment. The highly variable *C. christina* populations of the southern mountains seem to have been misinterpreted by various researchers as evidence of intergradation between the taxa.

In Alberta *C. alexandra* is a remarkably consistent species. Specimens differ from the nominate subspecies in the following characteristics: smaller size, narrower forewing black borders, darker grayish green ventral hindwing, almost all females white. These differences are more substantial than the differences between the nominate subspecies and subspecies *apache* which was described by Ferris (1988). Consequently these 'prairie' populations which are known from the plains of Alberta, Saskatchewan, Montana and North Dakota should be described as a new subspecies. Until such time as transitional populations to *C. alexandra* are documented, the possibility of separate species status for these prairie populations should not be categorically ruled out. Alberta populations of *C. alexandra* completely lack any dorsal hindwing discal spots which some literature deems to be a consistent characteristic of all *Colias* species. North American literature has traditionally claimed that this discal spot is concolorous with the ground color but close examination shows that there is in fact no discal spot.

The variability, within and between populations, of *C christina* makes general characterization over the whole province a real challenge. Some regional trends in Alberta are: boreal forest populations tend to be smaller, have a yellow ventral hindwing, frequently have ventral hindwing satellite spots and submarginal spots, and have a larger proportion of yellow and orange females; parkland populations are larger and have a pale greenish ventral hindwing; southern mountain populations are larger, have a greenish ventral hindwing and most females are white; the Mountain Park area in the northern mountains supports distinctive populations that are smaller, dark green on the ventral hindwing, frequently have substantial dark scaling on the basal portion of the dorsal hindwing and most females are white. Many male specimens from the Mountain Park area resemble *C. christina kluanensis* (a Yukon subspecies) more than any other named subspecies.

The archtypal phenotype of nominate male *C. christina* is that of a dorsal surface with a sharply divided deep, bright orange outer half and a bright yellow basal portion (eg. Gillette 1987). Such individuals do occur in all sampled populations of *C. christina* in Alberta; except the Mountain Park populations where the bright yellow basal portion of the dorsal hindwing is mostly replaced with melanic scaling. These archtypal phenotypes are, however, a minority in sampled populations. Examination of long series shows that variation runs from occasional individuals that are all yellow to those that are almost all orange. The most frequent male phenotype is a butterfly that is roughly one half orange and one half yellow on the dorsal surface with the orange of a paler hue and with an ill-defined transition from yellow to orange in comparison to the archtypal phenotype.

There remains then the problem of suitable names to attach to Alberta material. For the purpose of communicating the general appearance of individuals there is no problem. The existing names (*alexandra, astraea, krauthii, christina*) can be used as convenient 'handles' to communicate that the specimen at hand is consistent in phenotype with the characteristics normally associated with the name.

Attaching names in a true taxonomic sense is an unresolved problem at the time of writing. There is no published data to support lumping of the yellow prairie insect with nominate *C. alexandra.* Information presented herein suggests it is at least a distinct subspecies that should be formally described and given a name. The appropriateness of using the name *astraea* to refer to the southern mountain populations also needs to be critically reviewed.. Again no published data exists to support lumping of Alberta material with populations from the vicinity of the type locality; at least not at the subspecies level. Ferris (1973, 1988) attributes *astraea* to Alberta but does not provide data to refute the equally unsubstantiated and contradictory opinion of Masters (1975) who states that southern Alberta and Alberta mountain populations are "statistically at least distinct from typical *astraea* from Wyoming". At this time only the name *christina* can be confidently used as a species and subspecies name to reference the yellow/orange and mostly orange populations of the boreal forest.

For bibliogaphical information contact the author.

Authors Address:
Box 248, Taylor, British Columbia V0C 2K0.

Book Review

Butterflies of Alberta

John Acorn. 1993. Lone Pine Publishing. 143 pp. $16.95.

This new book has four strong points: it covers an area of Alberta's natural history that, until now, as been neglected; it is written in an easy-to-read manner; it has excellent colour photographs and line drawings; and it advocates an approach of observe or photograph rather than collect and pin. Also, like other Lone Pine books, this book is sturdy, attractively produced, has rounded corners, and is the right size to fit into a pack sack. This reviewer highly recommends it's purchase by local naturalists and visitors interested in Alberta's natural history.

Many naturalists have avoided butterflies because they felt that, though exquisitely beautiful, they could not be accurately identified without detailed study involving a specimen and access to a competently written treatise. John Acorn has clearly shown, with his fine illustrations and well written text, that, in most cases, such is not the case. His approach is refreshing and is certainly in keeping with today's trend toward more detailed awareness of our ecological surroundings, habitat loss, and the fact that many of our native species are becoming rare or endangered. The book is also in keeping with the "watchable wildlife" concept where increasing numbers of people find recreation and enjoyment out of observing and photographing all kinds of animal and plant life.

After an introductory section of 22 pages, in which many aspects of butterfly recognition and biology are covered, the author deals with the local species. Natural photographs are included for most species, supplemented in some cases with black and white line drawings. The photographs are accompanied by an informative description of various features of the species involved. A block at the bottom mentions wingspan, where and when found, similar species, and a generalized distribution map. An appendix gives a checklist of Alberta species which includes both common and scientific names.

Though a first class book in many respects, it is not without a number of shortcomings. One gains the impression that all of the species found in the province have been illustrated and are adequately described and mapped in the text. While the illustrations are in most cases excellent, not all species are represented and often essential characters needed for identification are not apparent. This is especially true in the sulphurs, blues, hairstreaks and skippers. The descriptions given, though quite helpful, often lack sufficient detail. The maps are oversimplified and tend to give the impression that distributions are wider than they actually are.

Another problem is the lack of scientific names in the main body of the book. Such an approach is ok for groups like birds and mammals where scientific names are rarely used but is not appropriate for groups like this where the use of scientific names has been the norm and where standardized common names for some species are not yet widely recognized. This shortcoming becomes obvious when one tries to compare illustrations of a species in the book with its counterpart in a book on the butterflies of another are area.

John Acorn and Lone Pine Publishing are to be congratulated for this book. It has been needed. It will help to fill a void in the bookcases on many field naturalists and of libraries throughout Alberta.

However, an oversight is the fact that no mention is made of a more detailed treatise on the butterflies of Alberta on which research and writing has been underway for over twenty years. The authors of this book, which will appear as a publication of the Provincial Museum, are G. J. "Gerry" Hilchie (editor), Norbert Kondla, Felix Sperling, Ted Pike, and the present reviewer.

Dr. Charles Bird, Professor of Botany (retired), Box 22, Erskine, Alberta T0C 1G0.

The Federation of Alberta Naturalists is publishing **"A Guide to the Care and Rehabilitation of Injured or Orphaned Wildlife in Alberta"**. It briefly describes what to do when encountering wildlife that is thought to be under stress, and provides a list of agencies and individuals that should be contacted to assist in dealing with this situation. These are provided on a regional basis. They include Fish and Wildlife offices, veterinarians with interest in wildlife, and rehabilitation organizations.

This publication was prepared by Derek Whitehouse, who worked in the FAN office this summer under the SEED program.

This booklet will be available at the FAN office or through member clubs.

F.A.N. Membership Fees Are: Regular $15 per year; Supporting, $25 or more per year (with excess over $15 being deductible from your taxable income). This entitles you to a subscription to the Alberta Naturalist.

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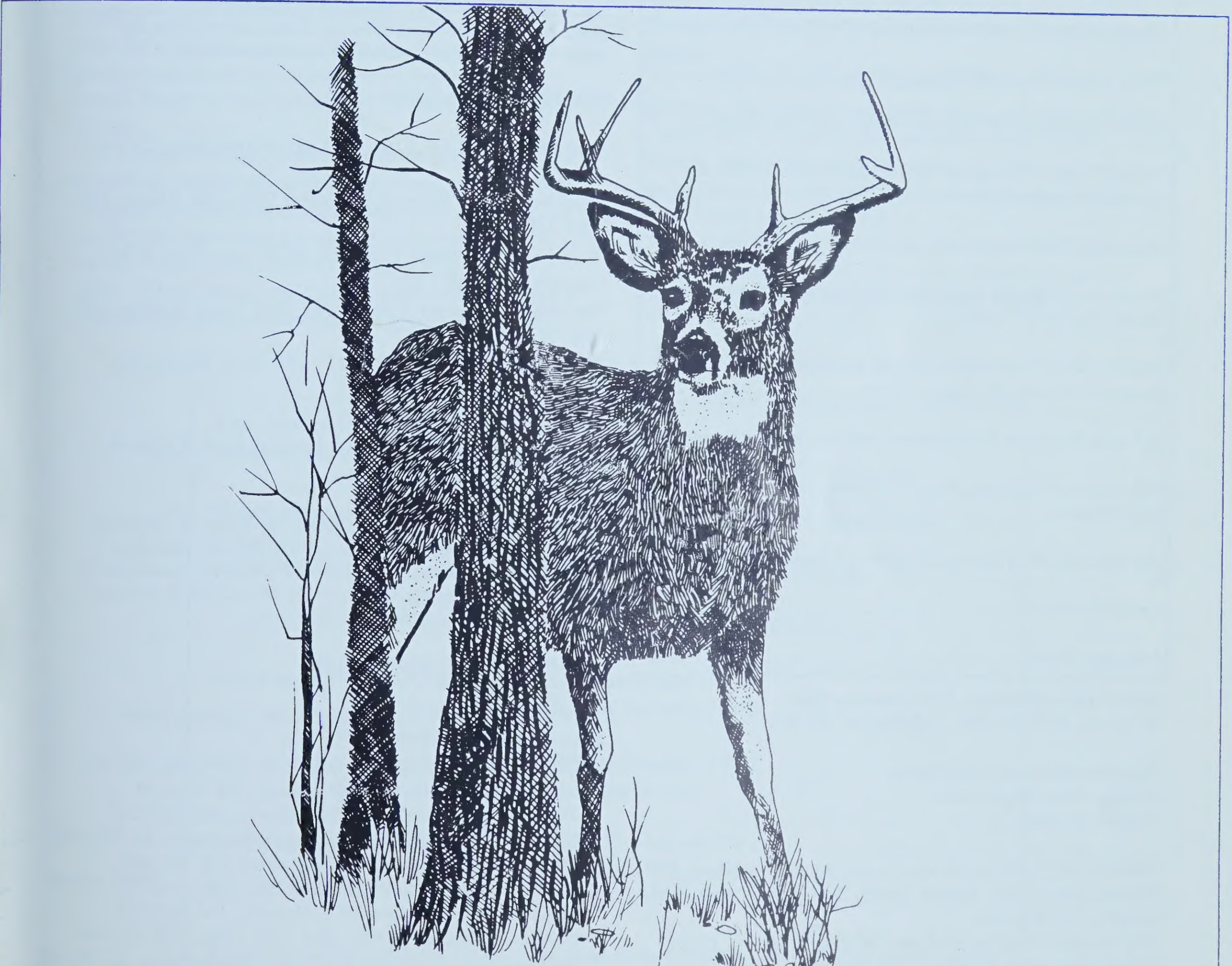
ALBERTA NATURALIST

Alberta's Natural History Review



Green Plan Eco-Research - Grande Prairie Natural Areas - C N F Conference - White Birch
Twenty Years of C B C Results - Slender-leaved Sundew - Ferruginous & Swainson's Hawk
Mountain Gentian - Fall Migrants - The Breeding Bird Survey

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CONTENTS

President's Page 1

Editor's Page 2

University of Alberta's Green Plan Eco-Research Program 3

Grande Prairie Natural Area Conference, Claire Radke 4

Canadian Nature Federation Conference, Don Stiles 3

White Birch from Southeastern Alberta, George Scotter 7

Mount Revelstoke NP has been Discovered, Don Stiles 8

Twenty Years of Christmas Bird Count Results in Alberta Naturalist, Andrew Slater 9

Canadian Wildlife at Risk 12

Occurence of Slender-leaved Sundew near Rocky Mountain House, Darrell R. Smith 13

Summer '93 a Catastrophic Year for Ferruginous and Swainson's Hawk, Dr. Edgar T. Jones 14

A Range Extension for Mountain Gentian, Derek Johnson ... 15

Fall Migrant Vireos and Wood Warblers at Lethbridge, Ross Munro 17

The Breeding Bird Survey in Alberta, J. Park and D. Ealey.. 20

Book Review 24

Magazine Review 25

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, Curtis Pollock, Box 1844, Vermilion, AB T0B 4M0.
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forestry Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.
Compiler cooperation is greatly appreciated.

Honorary Member: Professor W. Ray Salt

Patron: Hon. Dr. J.W. Grant MacEwan

The Federation of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) to promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into approptriate actions.

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Alberta Speleological Society, Box 2474, Jasper, AB T0E 1E0.
Bow Valley Naturalists, Box 1693, Banff, AB T0L 0C0
Buffalo Lake Naturalists, Box 1802, Stettler, AB T0C 2L0.
Calgary Field Naturalists' Society, Box 981, Calgary, AB T2P 2K4.
Edmonton Bird Club, Box 1111, Edmonton, AB T5J 2M1.
Edmonton Natural History Club, Box 1582, Edm., AB T5J 2N9 8G8.
Grasslands Naturalists, Box 2491, Medicine Hat, AB T1A
Lethbridge Naturalists' Society, Box 1691, Leth.., AB T2J 4K4.
Peace Paarkland Naturalists, Box 1451, Grande Prairie, AB T8V 4Z2
Red Deer River Naturalists, Box 785, Red Deer, AB T4N 5H2.
Vermilion River Naturalists, Box 1769, Vermilion, AB T0B 4M0.

Associate Members: Beaverhill Bird Observatory
Earth Care Peace Study Centre

President's Page

R. Barry Jenkins

The Christmas rituals are history once more; trees, lights and bird counts. I am amazed at the number of participants in the Christmas bird counts and even by the number of counts we do in Alberta. It seems to be the number one winter activity. I am sure we have more people out to count birds than play hockey or ski. I think it is because almost everyone can identify most of Alberta's winter birds and the novice birder can usually pair of with more experienced birders. The Christmas counts are fun and educational. If you don't know a nuthatch from a chickadee the Christmas count is a good place for a birder to start. There are counts all over the province, so if you are interested contact your local natural history or bird club for 1994 dates and team leaders.

Special Places 2000 is a provincial program that is not official yet but the momentum is still going forward. This plan is to identify and set aside representative samples of crown land for each of the provinces bio-regions, hopefully enough to make up 12% of each region. These areas would be set aside and protected either as a provincial park, natural area or ecological preserve, depending on the use these parcels can stand. Special Places are not just the rare or unusual sites, we also need to set aside typical examples of each region. If you know of a place that should be preserved in its natural state, whether it is a quarter section of native bush or a viable patch of prairie, contact the FAN office and we may be able to help get the ball rolling to preserve your special place. It is not an easy or quick process to create a provincial park or even a natural area but the sooner we start the process the less likelihood of your special place being "developed" in an inappropriate manner.

The annual General Meeting is held in Calgary this year. The tentative program looks as if there will be a number of workshops and speakers which would interest anyone who likes the outdoors. Come on out to the meeting, you won't be roped into anything and you would likely learn a lot.

I would like to thank everyone who has helped me so much during my two year term as President and I know you will be as helpful to the new President.

* *

The Federation of Alberta Naturalists

1994 Annual General Meeting and All Day Workshops

Workshops: "Selecting, Protecting and Caring for Private Natural Land"
Registrations: Saturday, January 29th., 8:30 a.m.
All day workshops: Saturday, January 29th., 9:00 a.m. to 4:00 p.m.
at the Highlander Hotel,
1818 - 16th. Avenue N.W., Calgary, Alberta

Prices are: $50 Workshops, evening speaker and dinner
($45 if postmarked by January 10th)
$40 Workshops only
($35 if postmarked by January 10th)
$20 Evening speaker and dinner only

Mail Registration Forms to:
F.A.N. Workshops '94
c/o 20 Lake Wapta Rise S.E.
Calgary, Alberta T2J 2M9

Annual General Meeting: Sunday, January 30th., at the McDougall Centre,
455 - 6th. Street S.W., Calgary, Alberta

Sunday Field Trip will be announced on Saturday....

Editor's Page

Complete text of Resolution 12

Alberta's Special Places 2000 Initiative

Whereas many of the natural regions of Alberta are poorly represented by protected areas (national parks, provincial parks, ecological reserves, natural areas);

Whereas Alberta's Minister of Environmental Protection recently announced his intent to complete the representation of all natural regions through an initiative called "Special Places 2000: Alberta's Natural Heritage -- Completing Alberta's Endangered Spaces Network";

Whereas the purpose of the Special Places 2000 program is to protect the full range of landscapes, environmental diversity and special natural features of Alberta by the year 2000;

Whereas one of CNF's priorities is to achieve protection for the full range of Canada's landscapes and biodiversity:

Therefore be it resolved that the CNF support the principles and approach for biodiversity representation outlined in the Government of Alberta's Special Places 2000 initiative; and

Be it further resolved that the CNF urges the Government of Alberta to immediately adopt the Special Places 2000 program as government policy and begin its implementation.

Three Wetland Reports Released

Dr. Alfred Birch, Executive Director of the Alberta Water Resources Commission, recently announced the release of three reports related to the Commission's work on a wetland policy for Alberta:

* *Wetland Management in the Settled Area of Alberta: An Interim Policy;*

* *Beyond Prairie Potholes: A Draft Policy for Managing Alberta's Peatlands and Non-settled Area Wetlands; and*

* *Alberta's Peatlands and Non-settled Area Wetlands; A Background Report.*

The overall goal for wetland management in Alberta, as presented in these reports, is 'to sustain the social, economic and environmental benefits that functioning wetlands provide, now and in the future'.

The *Interim Policy* was prepared in the first phase of the Water Resources Commission's current work on wetland management. It provides guidance to provincial departments responsible for wetland management in the Settled Area or agricultural and urban part of Alberta.

"The interim policy addresses concerns Albertans expressed about the loss of sloughs and marshes in the Settled Area, "Dr. Birch said. "It provides a clear statement of the government's intent to conserve these wetlands where possible."

Beyond Prairie Potholes: A Draft Policy for Managing Alberta's Peatlands and Non-settled Area Wetlands provides draft policy intents and management strategies for peatlands. *Alberta's Peatlands and Non-settled Area Wetlands: A Background Report* provides detailed information about these wetlands and how they are managed. These reports have been produced in the second phase of the Commission's wetland project.

"Peatland, or muskeg, as it is commonly called, covers much of northern Alberta," Dr. Birch stated. "A policy for wetland management will help resource managers in making decisions about protection and use."

Public workshops on the draft policy suggestions for management of peatland and other wetlands in the Non-settled Area were held in the fall. Following public and interdepartmental consultations, the revised policy recommendations will be combined with the interim policy for the Settled Area and presented for government approval as a comprehensive wetland policy for Alberta.

Interested individuals should contact the Commission to receive copies of these reports or to be notified of workshop dates and locations. For further information, contact: Dr. Alfred Birch, Executive Director or Mr. John Lilley, Research Director, Alberta Water Resources Commision: 422-4232 (Edmonton).

The proceedings of the Third Prairie Conservation and Endangered Species Workshop (1993, Provincial Museum of Alberta Natural History Occasional Paper No. 19) include 99 papers (384 pages) on topics involving agriculture, wildlife and the Prairie Conservation Action Plan. Copies may be ordered for $15 from Dan Chranowski, Manitoba Wildlife Branch, 1129 Queens Avenue, Brandon, Manitoba R7A 1L9 (cheque payable to TWS Manitoba Branch).

Still available are the proceedings of the Second Endangered Species and Prairie Conservation Workshop (1991, PMA Paper No. 15, 284 pages, 99 papers) for $15 and $3 postage from Blue Jay Bookshop, Box 4348, Regina, Saskatchewan S4P 3W6.

Proceedings of the First Workshop on Endangered Species in the Prairie Provinces (1987, PMA Paper No. 9, 367 pages, 82 papers) for $15 from the Edmonton Natural History Club, Box 1582, Edmonton, Alberta T5J 2N9.

NOTE: Orders from outside Canada should be in US funds to cover the additional postage.

University of Alberta's Green Plan Eco-Research Program

A Tri-Council Green Plan Program Training Canada's Future Environmental Scientists and Engineers

Purpose and Scope

The Program's purpose is to train Canada's next generation of environmental scientists and engineers. Canada needs more highly qualified toxicologists, hydrogeologists, and health and social scientists specializing in environment-related research. The program also aims to encourage the Canadian academic community to address regional ecosystem problems through interdisciplinary research.

The Eco-Research program consists of three main components: *doctoral fellowships,* to support the training of environmental scientists and engineers at the doctoral level at Canadian universities; *university research chairs,* to stimulate research and training opportunities in new environmental areas by attracting highly qualified and internationally recognized researchers who will help develop new training and research strengths in the environmental sciences; and *ecosystem research grants,* to bring together teams of researchers who will conduct interdisciplinary environmental research, integrating skills from the natural sciences and engineering, social sciences and health sciences, on Canadian regional ecosystems. All fellowships, research chairs and ecosystem research grants are awarded through a competitive peer review process.

The program will help to foster stronger alliances among industry, universities and governments. The program will also provide industries with ecosystem-based environmental research that will assist in planning long-term capital expenditures, as well as a highly qualified scientific pool from which to draw future personnel, consultants, etc.

The approximate distribution of funding and expected results over the six-year period are as follows:

Doctoral Fellowships

- Approximately 10% of the program's resources are for the support of 50 to 100 PhD candidates.

University Research Chairs

- Approcimately 20% of the program's resources are to be used for the creation of 5 to 10 university research ` chairs.

Research Grants

- Approximately 70% of the program's resources are for research grants to undertake between five and 15 regional ecosystem studies. Taken together, it is expected that these studies will provide training opportunities for 200 to 300 Canadian graduate students registered at Canadian universities.

Operation

A tri-council secretariat represents the Natural Sciences and Engineering Research Council of Canada, the Medical Research Council of Canada, and the Social Sciences and Humanities Research Council of Canada (SSHRC). It is housed at SSHRC, and coordinates the day-to-day administration of the Eco-Research program. The Tri-Council Secretariat is under the general direction of a Management Committee, made up of the three council Presidents, and of an Operations Committee, made up of the Directors General from the three councils.

The fellowships are open to students studying at the doctoral level at Canadian universities. They are awarded for a period of up to three years, and are worth $18,000 a year. Submissions for University Research Chairs may be made by any Canadian university, but each university is limited to a single application per year, and a single grant over the life of the program. The Research Grants competition has two stages. In the first stage, applicants must submit a Letter of Intent, in which they may also request a grant to fully develop their research proposal. The submission of full research proposals -- the second stage -- is by invitation only, following approval of the Letters of Intent by a peer review committee.

Applications for all three Eco-Research program components are examined by a peer review committee composed of members appointed by the three granting councils in consultation with Environment Canada. This committee includes both policy-makers and experts from the natural sciences and engineering, the social sciences and humanities, and the health sciences.

It is expected that the public and the private sector will supplement the federal funding provided by this program.

Environmental Science and the Green Plan

By encouraging and supporting the training of environmental scientists and engineers, this program will help to meet an important goal of Canada's Green Plan.

Public consultations on the Green Plan revealed that Canadians clearly accepted the principle that environmental Science and technology must underpin decision-making in both the public and private sectors. To reach this goal, more environmental experts are urgently needed. This initiative also reponds to recommendations formulated by the Social Science Federation concerning the immediate need for improved post-secondary training opportunities in the environmental sciences.

The Eco-Research program is aligned with the international movement toward sustainable development, which was first enunciated in the landmark 1987 Report of the World Commission on Environment and Development (the Brundtland Commission) and further developed by the Earth Summit in Rio de Janeiro last June. There, more than 110 world leaders put sustainable development squarely on the world agenda as an international goal. In brief, sustainable development means balancing economic and environmental concerns for the benefit of present and future generations.

Contact: University of Alberta, Eco-Research Chair, Environmental Risk Management, Environmental Health Program, Faculty of Medicine, 13 - 103 Clinical Sciences Building, U of A, Edmonton, Alberta T6G 2G3.

* *

Grande Prairie Natural Areas Conference

Claire Radke

F.A.N. members from Edmonton joined forces with the Peace Parkland Naturalists (PPN) on August 6-8th for a highly informative exploration of natural spaces around Grande Prairie.

A warm welcome (and buffet to boot) from PPN awaited the Edmonton visitors upon Friday evening's arrival at Grand Prairie Regional College. Reg Arbuckle, a waterfowl specialist with Ducks Unlimited, spoke encouragingly on the creation and maintenance of wetlands in the Peace region. Then a fasinating lecture followed on the surprisingly rich cache of duckbill dinosaur bones (rivals Drumheller) that can be found in abundance along Grande Prairie creek beds.

On Saturday morning, Alberta Public Lands' Debbie Stover met our group at Saskatoon Mountain Natural Area (SMNA), a former DND site. This interesting "island within an old glacial lake" has a variety of unique features: an archaeological native site (9000 year old artifacts), an active Columbian Ground Squirrel colony, and a lush, unspoiled boreal forest. Olive-sided Flycatchers, an American Redstart and White-winged Crossbills were our bird highlights. Nine sections or 2020 acres are in the process of being designated a "natural area" although other users have an interest in utilizing this hilltop site for windmills, ATVs, skiing and campsites.

PPN rustled up an afternoon barbecue at Saskatoon Island Provincial Park. While songbirds foraged along the aspen-treed lakeshore, our group made it's way through a jungle of saskatoon berries to Little Lake observation deck. We enjoyed sighting a resident pair of Trumpeter Swans; over 200 swans returned to the area this year.

Rick Scott, President of PPN, led the group on Sunday morning around Kleskun Hills Natural Area, one of the last examples of northern native grassland and the "badlands" of Grande Prairie. This quarter section boasted a diverse array of wildflowers scattered throughout dry, sage-filled fields. Our foraging produced blueberries, junipers, Hooded Lady Tresses, Northern Gentian, Stonecrop and Prickly Pear Cactus to name a few.

To summarize, it was encouraging to meet the local volunteers committed to conserving the wetlands/ natural areas of the region. Our group thanks PPN for organizing such an informative yet interesting weekend in northern Alberta.

Kleskun Hills Natural Area near Grande Prairie

Wild Sunflower at Kleskun Hills Photos: Claire Radke

Author's Address:
#301, 4611 - 20 Avenue, Edmonton, Alberta T6L 5W7.

Canadian Nature Federation Conference - Vernon, B.C. July 22 - 25, 1993

Don Stiles

The Canadian Nature Federation Conference was held at Silver Star Mountain near Vernon, B.C. The host club, the North Okanagan Naturalists' club, registered over 200 participants. A new conference centre near the many hotels associated with the skiing area was the actual conference site.

The local club hosted social events which have been features of CNF conferences in recent years such as a wine and cheese party, a barbecue (at O'Keefe Ranch), an awards banquet, and a farewell breakfast. Other events were early morning bird walks and a youth program.

Field trips were popular. There were two three-day pre-conference trips. One was a general natural history trip covering the Okanagan region to the U.S. border with leaders from three other clubs in different parts of the Okanagan. The second was a birding trip covering more or less the same area with Dick Cannings as the leader. Some highlights were Canyon Wren in the South Okanagan. This bird is more common to Arizona, but the leader knew where to find it.

I took in a one-day botany trip. Highlights for me were a swamp containing Jewelweed, common in eastern Canada but rare in B.C., and Yellow Monkey Flower; and a bog area at Mara Meadows, an ecological area on the side of a mountain northwest of Vernon, which had Lobelia, Sundew, and Bladderwort as well as numerous orchids, most of which were in fruit.

There were several other one-day field trips on birding, forestry, geology, and history and a two day post-conference trip to the Arrow Lakes and Mount Revelstoke National Park.

A Sunday afternoon chair lift trip to the top of the mountain allowed some alpine birdwatching and a botany field trip. We shared the chairlift with mountain bikers who have trails branching from the top of the mountain. Unfortunately, these mountain bikers are also using hiking trials so our return down the mountain was along a trail with a rut in the middle. More education and respect by the mountain bikers is needed to prevent rapid erosion of the hiking trails.

Conference papers were given on the Friday and Saturday. An introduction address by John Cashore, B.C. Minister of Environment, Lands and Parks, mentioned some of B.C.'s efforts at preservation. Yes, they are trying for 12% of lands with protected status by 2000. He said they will join the Heritage Rivers Program and the first candidate will be the Tatshenshini. The entire Tatshenshini-Alsek River system was announced as a provincial park on June 22, 1993.

Papers covered started at the beginning of time with a geology paper, followed by a history paper on the early history of the Hudson's Bay Company dealings with the Indians. The speaker's research indicated that the Indians considered the salmon as a resource they controlled.

Natural history papers covered subjects such as Endangered Species (Burrowing Owl, Pallid Bat, Tiger Salamander, Spade-foot Toad and others), the B.C. Nature Trust, Bird Life, Flora, Forest Ecosystems, and the Colombia Mountains. One paper dealt with a Kokanee (land-locked salmon) enhancement project. This was an enhancement of Mission Creek which flows west into Lake Okanagan just south of Kelowna. The project was a major effort, as they had to put in special sized gravels, and vegetation of the creek sides to give optimum conditions for spawning. Another paper dealt with Vernon Spray Irrigation System. The city of Vernon is collecting their effluent and sludge and using it for spray irrigation on hay land and forest. Although slightly more costly, it avoids putting any effluent into Lake Okanagan as is done in other parts of the Okanagan region. For results, watch for the Kalamalka Forest Research Centre on the southern outskirts of Vernon on Highway 97, with its nearby forest, watered using effluent.

The Annual General Meeting reported on the estate of the Canadian Nature Federation, which is still in a deficit position after suffering losses from their bookstore operation which closed in 1992. They have a staff of 11 people, including a dynamic new executive director, Julie Gelfand. Five of the staff are working in conservation and education, with the remaining 6 working on publications, membership, and administration. CNF has a good magazine in Nature Canada, and a topical newsletter in Nature Alert. Both are sent out in the same mailing to save funds. Julie Gelfand suggested that we be part of the solution for conservation, talk to all players, and avoid segregation. CNF will be working for improved communication with the affiliates and trying for additional donations, including corporate.

Thirteen resolutions were presented, covering conservation issues from all across Canada. (See resolution 12 for an Alberta resolution). Thanks to Cliff Wallis, Western Regional Director, and resolutions committee chairman, who helped to generate these, which are summarized below.

1) Native Grasslands in Interior B.C.
CNF urges government to implement strategies to protect grasslands, both public and private.

2) Clayoquot Sound
Look at forestry practices. Release these for public review and comment.

3) Garry Oak
Recommend protecting this habitat on the southeast coast of Vancouver Island. (See article in Nature Canada, Summer 1993).

4) Marine Parks
Recommend 7 new areas along all coastlines by 2000.

5) Grassland National Park
Recommend reinstatement of funding for land acquisition. Purchases have been going slowly.

6) Resource Management in National Parks
Recommend adhering to the 1988 Parks Act which puts protection as the first priority. Recommend enhancing commitment to an ecosystem approach.

7) Tatshenshini-Alsek
Area Suggested as a world heritage site.

8) Hautes Gorges area in the Charlevois region of Quebec
Work towards a Laurentian Boreal Highland National Park (which would include Hautes Gorges).

9) Wolf Control Program - Yukon
Recommend environmental assessment first. Urge stopping the current program until this is done.

10) Madawaska Highlands - Eastern Ontario
Last large wilderness south of Algonquin Park. Recommend ensuring a core protected area.

11) Prairie Region of Canada
A threatened ecosystem. Urge Federal Government to take into account an ecological approach to land under federal jurisdiction. Present programs subsidize farmland, and allow clearing to increase pasture.

12) Special Places 2000 - Alberta
(See full text of resolution on page 2)

13) Ground Fishery - Newfoundland
Urge Canada to take control of the Nose and Tail of the Banks. (Canada's continental shelf beyond the 200 mile limit). Other nations are ignoring quotas, and some others are not even part of treaties. These fisheries are 5% of what they were 15 years ago. The Grand Banks of Newfoundland are one of the few areas in the world where the 200 mile limit does not cover the full continental shelf.

Resolutions on major issues for next year should be sent to Cliff Wallis, c/o Cottonwood Consultants, 615 Deercroft Way, Calgary, AB T2J 5V4, several months ahead of next years conference. The 1994 Canadian Nature Conference is being held in Halifax, N.S., from Aug. 4th to 7th. I would recommend a CNF conference as a way to see a different part of Canada, and to appreciate how people in other places are working to save parts of Canada's natural history.

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Harebell (Campanula rotundifolia)
Photo: P.S. Debnam

White Birch *(Betula papyrifera)* From Southeastern Alberta

George W. Scotter

The Flora of Alberta (Moss, 1983) did not record white birch (Betula papyrifera) in southeastern Alberta (Map 429). White birch, however, are known to occur there in at least three different sites. The purpose of this note is to document those locations.

While hiking with W.E. Stevens and H.J. Armbruster from the South Saskatchewan River to the Middle Sand Hills region of the Suffield Military Reserve, I noted a single white birch tree (Betula papyrifera var. papyrifera) near the top of a coulee (50°36'N, 110°20'W, elevation 685 m). The tree was about 10 m tall, towered above the surrounding vegetation, and had a dbh of approximately 30 cm. Leaves, fruits, twigs and bark were collected and sent to DA0 (Collection No. 22813, 6 June 1974). Despite the fact that several other coulees along the river from Medicine Hat to near the Saskatchewan border were inspected during the course of additional fieldwork, no more birch trees were seen.

Equally as interesting as the unusual occurrence of this tree is speculation on how it became established. There was no evidence its establishment resulted from man's activity.

On 1 June 1993, I studied a small grove of white birch near the north boundary of Cypress Hills Provincial Park 49°40°,110°14′ 15W), under a research and collection permit provided by the Alberta Parks Service. The white birch/aspen (Populus termuloides) stand occurred on a north slope of 23 percent, at an elevation of 1250 m. The stand covered an area of about 300 m by 50 m. The trees had an average dbh of 18.1 cm and an average height of 14.6 m. Two-thirds of the trees were white birch and the remainder were aspen. Leaves, fruits, twigs and bark of the white birch were collected (No. 97, 726) and distributed to herbaria at Agriculture Canada, Ottawa (DAO); Northern Forestry Centre, Edmonton (CAFB); and University of Alberta, Edmonton (ALTA).

A single white birch tree is located about 1.5 km southeast of that grove. These are the only white birch known in Cypress Hills Provincial Park, Alberta (personal communications, Jon Dewalt).

I would like to acknowledge the assistance of Jon Dewalt, Cypress Hills Provincial Park, for assistance in finding the white birch stand and for measurement data on it.

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White Birch (Betula papyrifera) Photo: J.D. Johnson

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* *

The Atlas of Breeding Birds of Alberta

Presents current distribution, status, and habitat of nesting birds in Alberta. 400 pp. of color maps and photos, species accounts and bibliography.
"New birding bible takes flight" Calgary Herald
"Casual birders and serious naturalists have a powerful tool and great toy" Globe and Mail
This perfect gift for any one with an interest in birds is available at local book stores, and
the Federation of Alberta Naturalists,
Box 1472, Edmonton, Alberta T5J 2N5,
Phone: (403) 453-8629

Mount Revelstoke National Park has been Discovered

Don Stiles

The spectacular displays of mountain wildflowers at the top of Mount Revelstoke have been discovered by the public. Visitation has increased from 8,500 in 1985 to over 300,000 in 1992 (from the Selkirk Summit, A Visitor Guide to Mount Revelstoke and Glacier National Parks. - 1993).

In previous years one could drive to the top and walk around on gravel paths, or actually anywhere, if no one caught you. This year you drive to a parking lot at the Balsam Lake picnic area about 2 km short of the summit. Then proceed to the top on a small bus with a park staff driver and interpreter, who explains to you that Parks Canada has constructed two paved trails from the Historic Fire Lookout. The interpreter told us that people are to stay on the trail, and they stopped the bus to correct anyone who had taken a step off the road, say to take a photograph. They said the previous policing wasn't working very well and that they hoped this idea of educating people as they rode up on the bus would work better. So far it seems to be, as I didn't see anyone off the trail, although I heard someone express frustration at not being able to get closer (off the trail) to a patch of flowers for a photograph.

Some parts of the area look like a flower garden in places with large patches of one or two species, although the number of flower species is not numerous. A summit flower list follows, with most of the Latin names taken from display boards along the trail.

Ranunculus eschscholtzii - Alpine Buttercup
Luetkea pectinata - Partridge Foot
Lupinus latifolia - Lupine
Cassiope mertensiana - White Mountain Heather
Phyllodoce empetriformis - Red Mountain Heather
Rhododendron albiflorum - White-flowered Rhododendron
Castellija rhexifolia - Red Paintbrush
Valeriana sitchensis - Sitka Valerian
Arnica latifolia - Mountain Arnica

Blue Lupine

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* *

Notice of Publication

Rare Vascular Plants in the Canadian Arctic
by Cheryl McJannet, George Argus, Sylvia Edlund and Jacques Cayouette, Canadian Museum of Nature, Ottawa (1993), 79 pages. Price in Canada: $14.92 (including Postage, handling, and GST).

This publication is the latest to emerge from the Canadian Rare Plants Project which is supported by the Research Division of the Canadian Museum of Nature. It was compiled to identify the rare vascular plants of the Canadian Arctic as part of the Canadian contribution to the International Circumpolar Agreement on the Conservation of Arctic Flora and Fauna.

This annotated list treats 236 rare vascular plants taxa in the Canadian Arctic which encompasses northern portions of Yukon Territory, Northwest Territories, Quebec, Ontario, and Labrador. The limits of the Canadian Arctic are defined and the criteria used to determine a taxon's rarity are included. For each taxon a comment is included on phytogeography, occurrence in the Canadian Arctic, and the rare status in other parts of Canada. A distribution map showing known occurences in the Canadian Arctic is included for each species.

Thr rare arctic taxa included in this publication represent a unique part of Canadian biodiversity and their recognition is an important step toward characterization and representation of Arctic ecosystems.

This publication is available in English from : Direct Mail, Canadian Museum of Nature, P.O. Box 3443, Station "D", Ottawa, Ontario K1P 6P4, or call toll free at 1-800-263-4433.

Twenty Years of Christmas Bird Count Results in Alberta Naturalist

Andrew Slater

With publication of the 1992 tabulation, a continuous record of Christmas Bird Count results in the province for twenty years was completed in this journal. Over that time, no fewer than 158 species were reported to occur in Alberta at least once during the Christmas count period. The following table shows in how many years of the twenty each species was reported and the highest annual total of individuals during the period for each.

The tremendous growth in popularity of counting wintering birds at Christmas is shown by the fact that in 1973, six counts with 105 participants were included, while, by 1992, the results had mushroomed to a massive compilation of 67 counts with 2131 participants!

Such an increase in coverage means, of course, that comparisons of totals over the years are not, in most cases, very meaningful. Nearly all of the highest annual totals listed occurred during the late eighties and nineties when extensive participation had been achieved.

A few exceptions involve birds that irrupt into the province each winter in highly variable numbers, such as the Snow Bunting, whose highest total was in 1983, or whose numbers are augmented regularly by introductions, such as the Ring-necked Pheasant, which peaked in 1978. There are no species, I am glad to report, not even the pheasant, for which the results indicate a definite long-term decline.

Another interesting exception is the White-winged Scoter. In 1982 a flock of 201 was counted at Wabamun Lake, while in only one other year has the species been found at all, when two individuals were seen on that count.

One trend that is clearly discernable, despite the inconsistent coverage, is the growth in numbers of waterbirds lingering in Alberta into mid-winter. The Great Blue Heron, for instance, was first found in 1982 and has now occurred in eight years.

From 1973 to 1975 inclusive, only one Canada Goose was listed. From 1986 onward several thousand were counted every year, with fourteen thousand in 1991!

The majority of the Mallards in the province at Christmas are always on one count, Calgary, so the total of this waterfowl is not drastically affected by the increase in coverage elsewhere. In the first few years, the provincial total was regularly below five thousand, while since the mid-eighties it has always been around or above twenty thousand, an increase probably quite real.

Another, unrelated, species showing a genuine increase is the White-breasted Nuthatch, whose provincial numbers have increased from less than 20 annually in the first few years to over five hundred in the last few.

By way of contrast, of the species that were reported every year, the Prairie Falcon has by far the lowest total and average; in many years only a handful have been found. The Gyrfalcon has also become a consistent winter visitor in very small numbers.

Sage Grouse showed up in the compilation in just one year because that is the only time a count has been done in the Southeast corner of the province where they are resident. Similarly, Wild Turkey would have been reported more often if regular counts had been carried out in the Cypress Hills.

My predecessor as Provincial Compiler, from 1973 to 1983, was Virginia Lang, sometimes assisted by Chip Weseloh.

It is interesting, looking back at the 1973 report, to see that the six counts included were Calgary, Cold Lake, Edmonton, Jasper, Red Deer and Stettler. The count compilers for Calgary and Stettler were respectively Ian Halladay and Lloyd Lohr, who have continued to report those counts up to the present time.

The ever-increasing enthusiasm for outdoor activities and improved knowledge of bird identification and behaviour that are evident in the province inspire confidence that carrying out, compiling and publishing Christmas bird counts in Alberta will continue to be enjoyable, rewarding and informative over the next twenty years as well.

Hermit Thrush Photo: Dan Farr

	No. of Years	Highest Total
Common Loon	3	2
Yellow-billed Loon	1	1
Pied-billed Grebe	9	4
Horned Grebe	6	5
Red-necked Grebe	3	1
Eared Grebe	2	2
Western Grebe	14	6
Double-crested Cormornat	3	1
Great Blue Heron	8	6
Black-crested Night Heron	1	1
Tundra Swan	4	1
Trumpeter Swan	2	4
White-fronted Goose	1	1
Snow Goose	2	1
Ross' Goose	1	1
Canada Goose	18	14002
Wood Duck	3	4
Green-wing Teal	19	14
American Black Duck	3	1
Mallard	20	30891
Northern Pintail	18	32
Blue-wing Teal	5	3
Northern Shoveller	7	2
Gadwall	16	81
American Wigeon	17	89
Canvasback	12	15
Redhead	14	83
Ring-neck Duck	11	14
Greater Scaup	1	1
Lesser Scaup	18	277
Harlequin Duck	7	7
Oldsquaw	4	2
White-wing Scoter	2	201
Common Goldeneye	20	2095
Barrow's Goldeneye	18	44
Bufflehead	19	50
Hooded Merganser	13	27
Common Merganser	20	116
Red-breasted Merganser	5	2
Ruddy Duck	9	21
Bald Eagle	20	56
Northern Harrier	11	11
Sharp-shin Hawk	12	4
Cooper's Hawk	12	4
Northern Goshawk	20	56
Swainson's Hawk	2	1
Red-tail Hawk	10	6
Rough-leg Hawk	20	128
Golden Eagle	18	34
American Kestrel	10	3
Merlin	20	60
Peregrine Falcon	5	1
Gyrfalcon	15	10
Prairie Falcon	20	18
Gray Partridge	20	1545
Ring-neck Pheasant	20	330
Spruce Grouse	14	14

	No. of Years	Highest Total
Blue Grouse	2	1
Willow Ptarmigan	6	17
White-tail Ptarmigan	10	48
Ruffed Grouse	20	300
Sage Grouse	1	3
Sharp-tail Grouse	20	354
Wild Turkey	5	22
American Coot	14	37
Killdeer	16	32
American Avocet	1	1
Common Snipe	16	7
Ring-bill Gull	2	5
California Gull	1	3
Herring Gull	1	1
Glaucous Gull	3	2
Black-leg Kittiwake	1	1
Rock Dove	20	11032
Mourning Dove	9	5
Western Screech-owl	1	1
Great Horned Owl	20	229
Snowy Owl	20	52
Northern Hawk Owl	13	20
Northern Pygmy-owl	15	18
Barred Owl	12	3
Great Gay Owl	17	37
Long-eared Owl	3	1
Short-eared Owl	19	84
Boreal Owl	10	4
Northern Saw-whet Owl	12	24
Belted Kingfisher	19	18
Downy Woodpecker	20	1186
Hairy Woodpecker	20	744
Three-toed Woodpecker	20	81
Black-backed Woodpecker	18	11
Northern Flicker	20	107
Pileated Woodpecker	20	79
Horned Lark	18	4597
Gray Jay	20	657
Steller's Jay	14	23
Blue Jay	20	3450
Clark's Nutcracker	20	281
Black-billed Magpie	20	10155
American Crow	20	134
Northern Raven	20	3420
Black-capped Chickadee	20	16836
Mountain Chickadee	20	273
Boreal Chickadee	20	1007
Chestnut-Backed Chickadee	3	6
Red-breasted Nuthatch	19	1030
White-breasted Nuthatch	20	704
Pygmy Nuthatch	1	1

	No. of Years	Highest Total
Brown Creeper	20	102
Winter Wren	7	2
American Dipper	20	71
Gold-crested Kinglet	20	277
Ruby-crested Kinglet	2	6
Townsend's Solitaire	16	18
American Robin	20	71
Varied Thrush	9	4
Brown Thrasher	1	1
Bohemian Waxwing	20	36807
Cedar Waxwing	20	116
Northern Shrike	20	78
Loggerhead Shrike	4	3
European Starling	20	2449
Orange-crested Warbler	1	1
Cape May Warbler	1	1
Yellow-rump Warbler	2	1
Northern Cardinal	2	2
Rufous-sided Towhee	3	1
American Tree Sparrow	17	139
Lark Sparrow	1	1
Savannah Sparrow	1	1
Fox Sparrow	1	1
Song Sparrow	11	4
Swamp Sparrow	1	1
White-throated Sparrow	15	26
White-crowned Sparrow	7	6
Harris' Sparrow	7	3
Dark-eyed Junco	20	458
Lapland Longspur	8	207
Snow Bunting	20	12718
Red-wing Blackbird	6	16
Western Meadowlark	9	4
Yellow-headed Blackbird	3	4
Rusty Blackbird	15	101
Brewer's Blackbird	12	9
Common Grackle	6	5
Rosy Finch	8	327
Pine Grosbeak	20	3614
Purple Finch	12	33
House Finch	6	2
Red Crossbill	20	388
White-winged Crossbill	19	4976
Common Redpoll	20	10388
Hoary Redpoll	19	236
Pine Siskin	18	865
American Goldfinch	3	14
Brambling	1	1
Evening Grosbeak	20	2269
House Sparrow	20	22743

BIRDQUEST

Learn about North American birds – their identification, life histories, habitat and conservation needs – through the *Canadian Nature Federation's* and the *Canadian Wildlife Service's* (Environment Canada) new education program, BIRDQUEST. Each instructor's kit includes a VHS instructional video, workbook, badges and certificates. Suitable for groups, schools, clubs, etc. All age levels. $49.95 plus shipping and taxes.

To order or for more information, call the CNF at
1-800-267 4088.

Also available in French as A TIRE-D'AILE.

Canadian Wildlife at Risk

There are now 236 species of wild plants and animals officially designated in Canada as being in jeopardy. Human activity poses the greatest threat to wildlife and the diversity of nature. Some experts calculate that, if present trends continue, up to 25% of the world's species could become extinct, or be reduced to tiny remnants, by the middle of the next century

Saving endangered wildlife is crucial, both for the sake of the species themselves *and* to protect the life-support system on which we all depend for our livelihood and well-being. Plant and animal species provide us with medicine, food, fuel, shelter, clothing, recreation, and cultural and spiritual inspiration. When a wild plant or animal becomes extinct, we lose part of our natural heritage -- some of the wealth of life on earth -- forever.

The challenge

Species are disappearing because of habitat loss, unsustainable use of renewable resources, wasteful consumption, and pollution. Yet people everywhere depend on nature and the wise use of natural resources for a sound economy and their general well-being. Therefore, World Wildlife Fund believes we can and must find an appropriate *balance* between use and protection of the natural world. Careful, sustainable development -- i.e. which is fully respectful of nature -- is clearly desirable. But it is also clear that there are some sites which, because of their ecological significance or their importance as the habitats for endangered species, should be protected from *any* development.

World Wildlife Fund works co-operatively with private landowners, local communities, industries, and governments to protect natural areas, to ensure the recovery of species at risk, and to promote environmentally sound economic activity through sustainable land use. World Wildlife Fund is pledged to continue this co-operative approach. Right now, over 200 World Wildlife Fund projects are underway across Canada to help protect species and ecosystems. Read on to find out more about wildlife species in jeopardy, how World Wildlife Fund projects work to help save them, and how you can help.

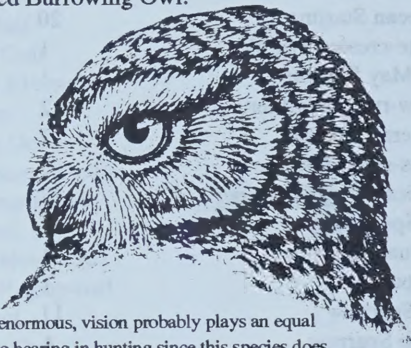
What is Being Done

Since 1967, World Wildlife Fund Canada has supported hundreds of hands-on field projects to protect endangered species.

World Wildlife Fund has also raised funds from government and the private sector to fund over 300 status reports on species at risk for the *Committee on the Status of Endangered Wildlife in Canada.*

Here is a quick look at just three of the many conservation projects World Wildlife Fund sponsored last year to help save threatened wildlife:

* in the eastern Arctic, whale biologists discovered that endangered Bowhead Whales travel from Canada to Greenland across the Davis Strait;
* along coastal British Columbia, biologists found Canada's first five nests of the threatened Marbled Murrelet, a seabird nesting in the ancient Pacific rainforest;
* in Alberta and Saskatchewan, over 1,000 land owners voluntarily protect habitat on their farms for the threatened Burrowing Owl.



Eyes enormous, vision probably plays an equal role to hearing in hunting since this species does much of its hunting at dawn and dusk.

In addition to working on these species in jeopardy, WWF funded over 200 urgent conservation projects, including work on:

* threatened Spiny Soft-shelled Turtles in Ontario;
* endangered Peary Caribou of the Northwest Territories;
* threatened Pine Marten of Newfoundland.

With your help, our work will continue. In addition to species already mentioned, WWF will fund conservation projects on these species over the coming year:

* endangered Whooping Cranes of Alberta and the Northwest Territories;
* the threatened Copper Red-horse (a fish) in Quebec;
* rare and endangered wild-flowers of Nova Scotia.

Of course, all this work only happens if *you* continue to support wildlife conservation through World Wildlife Fund Canada. Whether it is help for Grizzly Bears in the Rocky Mountains, rare orchids on the Prairies or Right Whales in the Bay of Fundy, it is *your* membership in World Wildlife Fund Canada which can make the crucial difference.
(Reprinted from World Wildlife Fund, 90 Eglinton Ave., East, Suite 504, Toronto, Ontario M4P 2Z7).

Occurrence of Slender-leaved Sundew *(Drosera Linearis Goldie)* near Rocky Mountain House

Darrell R. Smith

The Slender-leaved Sundew (Drosera linearis Goldie) has a northern distribution and has been categorized as a species which is rare in much of its North American range (Wallis 1987). In Alberta, the Slender-leaved Sundew is at the western part of its range, and can be found locally common in Alberta (Wallis et. al. 1987). Slender-leaved Sundew is considered rare in Alberta, as specimens have only been collected and identified in three other locations (Packer and Bradley 1984). In August of 1993, an extensive population of Slender-leaved Sundew was found approximately 34 km southwest of Rocky Mountain House, Alberta (Fig. 1).

This population of Slender-leaved Sundew was found in a floating bog with some open water nearby. Outwards from the open water, there was no tree cover and the site was dominated by sedges (*Careex* sp.) and *Sphagnum* moss with water laying at the surface. The Slender-leaved Sundews were found almost submerged in the water. This is the typical habitat in which the Slender-leaved Sundew occurs (M. McNaughton pers. comm.). Other plants found in association with the sundew were Grass-of-Parnasses *(Parnassus paulistris)*, Hooded Lady's Tresses *(Spiranthes romanzoffiana)*, Northern Bog Orchid *(Habenaria hyperborea)*, and Swamp Lousewort *(Pedicularis parviflora)*. Five specimens of Oblong-leaved Sundew *(Drosera anglica)* were found as well.

The remainder of the bog was tree covered, dominated by larch *(Larix laricina)* and black spruce *(Picea mariana)* with a shrub layer of bog birch *(Betula glandulosa)*. The Slender-leaved Sundew disappeared as the moss hummocks became more pronounced and the shrubs and trees began to occur.

This population of Slender-leaved Sundew is now protected as Land and Forest Services has placed a protective notation on the site. This entails a land use restriction, meaning agricultural or other surface dispositions are not permitted on the site (eg. no grazing, roadways, wellsites, etc.).

Also, three other locations near Rocky Mountain House have Slender-leaved Sundew. One population was found near Jackfish Lake, west of Rocky Mountain House, in 1988 (Sweetgrass Consultants 1989). In 1990, two other populations were found. One location was northwest of Rocky Mountain House in the Crimson-Louis Lake wetlands, and the other was southeast of Rocky Mountain House along Horseguard Creek (Sweetgrass Consultants 1991). Based on these recent findings, the Slender-leaved Sundew may have to be re-evaluated as to whether this plant is rare or perhaps uncommon. Further scouting should be done in the Rocky area to determine if other populations of Slender-leaved Sundew are encountered.

If anyone has come across other populations of Slender-leaved Sundew in the Rocky Mountain House area, or any other rare plants, please let the author know. These locations can then be protected in the same manner as mentioned above.

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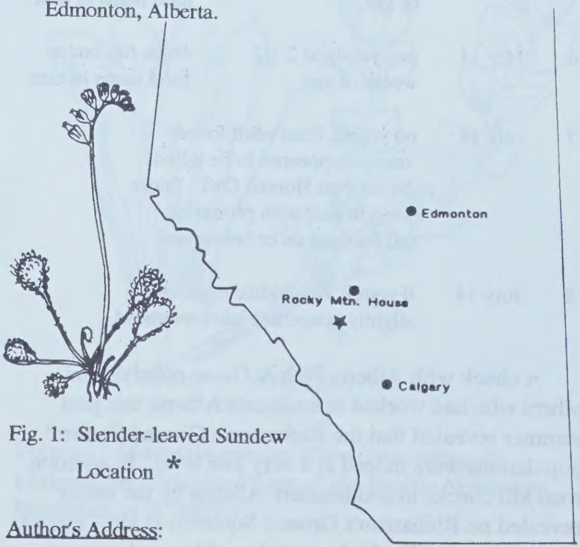

Fig. 1: Slender-leaved Sundew
Location *

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Summer '93-- A Catastrophic Year for Ferruginous and Swainson's Hawk

Dr. Edgar T. Jones

A wet, cold spring and summer, or the fact that Richardson's Ground Squirrel's were either non-existent in some areas, or in very very low numbers in other areas, has made it clear that Swainson's and Ferruginous Hawks did not fare well in southeastern Alberta during the 1993 nesting season. My annual banding safari and nest check has been made for the past six to eight years banding those young birds which were large enough to hold a band as well as the occasional aggressive adult which could be caught. The results this year came in well below average; only ten young in six nests were banded from a total of 75 nests checked. The nests which were checked have been occupied with young in one or two of the past three years.

Richardson's Ground Squirrels were found in nest checks. Food items were recorded as follows:

Nest #	Date	Age of Young	Food
1	July 13	one young at 3 weeks of age	no food items in nest
2	July 13	one young at 3 weeks of age	3 short-tailed Meadow Voles
3	July 13	two young at 3 weeks old	one young Horned Lark in nest
4	July 14	three young at 3 1/3 weeks of age	one young Savannah Sparrow in nest
5	July 14	two young at 3 weeks of age	crops full but no food items in nest
6	July 14	one young at 2 1/2 weeks of age	crops full but no food items in nest
7	July 14	no young, dead adult found on nest appeared to be killed by a Great Horned Owl. Entire wing in nest with primaries, tail feathers on or below nest	
9	July 14	0 young, two addled eggs, one slightly concerned adult overhead.	

A check with Alberta Fish & Game officials and others who had worked in southeast Alberta this past summer revealed that the Richarson's Ground Squirrel populations were indeed at a very low level. In addition road kill checks in southeastern Alberta by the writer revealed no Richarson's Ground Squirrels at all -- a most unusual result. The higher number of fox and coyotes could be a contributing factor to the Hawks' decline. This along with high water levels in some areas, which could have resulted in flooding, would seem hardly enough to cause such a catastrophic decline. There are no reports of a disease out-break in the area.

Many pairs of Swainson's adults were seen in the vicinity of previously used nests, with varying degrees of nest attachment from one to some concern at our approach. Other notes on Ferruginous Hawks, Merlins, and other species follow:

Ferruginous Hawks

Of 21 nests observed which had occupancy in other years, only four were occupied this year, yielding five young at 4 1/2 weeks of age. Near some nests several flying young were observed nearby; likely additional young from the nests banded. One nest in a dead poplar contained at least one dead young approximately 4 1/2 weeks old, indicating possible use of gopher poison in the area. This nest could not be examined due to the fact it was in a dead rotting poplar 10 to 12 metres from the ground. One adult only was seen at this site and not too concerned.

Merlin

Only two occupied nests were banded this year. The first with three young in an old magpie's nest had one addled egg and a young horned lark in the nest and the second had two young three weeks old with no food and only a few unidentifiable feathers present. Several other adult Merlins were seen along fenceposts but they presented no evidence of nesting.

Loggerhead Shrikes

There appeared to be an unusually large number of nesting pairs throughout the area with one late nest on July 13th containing four just hatched young and two eggs.

Lark Buntings

This species was more numerous than ever with sizeable flocks of adults and flying young. They appeared to have enjoyed a good nesting season in spite of the unusually cold weather periods combined with heavy showers. It was noted also that many normally dry slough areas (due to many years of drought) were filled with water which could auger well for future years if this water can be retained for future summers.

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A Range Extension for Mountain Gentian *(Gentiana calycosa* Griseb.)

J. Derek Johnson

Who says FAN meetings never come up with anything exciting? At the FAN fall meeting in Blairmore, September 18-19, 1993, the Sunday relief field trip for the overtaxed directors was to the Window Mountain Lake area along the Atlas Forestry Road, north of Coleman (49° 49'N, 114° 37'W). We were able to drive to an elevation of about 2400 m from where we began our hike up through subalpine forest composed of Engelmann spruce, subalpine fir, subalpine larch, lodgepole pine and whitebark pine to a ridge overlooking Window Mountain Lake. Morning weather conditions on the day were excellent, but it was not the best of days to be botanizing, as about 15 cm of snow had fallen the week before and much of the ground was still snow-covered, although it was soft and melting. At an elevation of approximately 2438 m, in a small southeast-facing meadow amongst stunted conifers *(krummholz)* near treeline, my attention was directed toward a few clusters of yellowing plants with fading blue flowers. I knew immediately that we were looking at a species of gentian, but it was not one I was immediately familiar with. Two stems were collected for identification. The specimens have been deposited in the herbarium of the Northern Forestry Centre (CAFB) in Edmonton (Johnson 9115).

After consulting the Flora of Alberta (Moss 1983), I concluded that the plant we had observed was mountain gentian *(Gentiana calycosa* Griseb.*)* (Figure 1). The only other species of gentian that mountain gentian might be confused with is prairie gentian *(Gentiana affinis* Griseb.*)*. In prairie gentian, the leaves are usually at least twice as long as broad, and the flowers are usually several, with calyx lobes acute and corollas 2-3 cm in length. In mountain gentian, the leaves are rarely as much as twice as long as broad, more closely spaced on the stem, and the flowers are usually single, with calyx lobes acute and corollas 3-4 cm in length. As the common names suggest, the two species are also separated by habitat, with mountain gentian occurring at much higher elevations than prairie gentian.

Finding mountain gentian was interesting enough for me as it was the first time I had seen the species, but it became even more interesting when I began to check its distribution. In Canada, mountain gentian occurs only in extreme southeastern British Columbia (King Edward Peak and Wall Lake) (Straley et al. 1985), and southwestern Alberta (Lower Rowe Lake, Alderson Lake, Ruby Lake, and the upper Oil Basin area in Waterton Lakes National Park) (Kuijt 1982). It is rare in both provinces (Straley et al. 1985, Packer and Bradley 1984). It becomes more common southwards into the U.S., including Montana, Idaho, Washington, Oregon, Wyoming, Colorado, Utah, Nevada, Arizonza, and New Mexico (Argus and Pryer 1990). The Window Mountain Lake locality is approximately 80 km north of the nearest known locality in Waterton Lakes National Park. This is not a large range extension, but considering the general accessibility of the site, it is mildly surprising that it has not been encountered before. The Window Mountain Lake area represents the northernmost collection location for mountain gentian in North America that I am aware of. Because of its highly restricted distribution in Canada, mountain gentian has been given a national priority rating of 1 (critically imperilled because of extreme rarity) by Argus and Pryer (1990), although the sites in Waterton Lakes National Park appear to be secure.

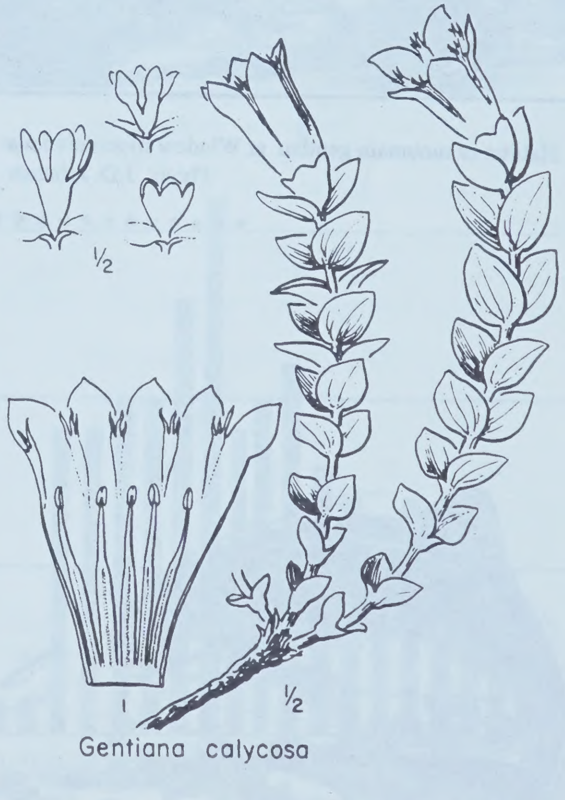
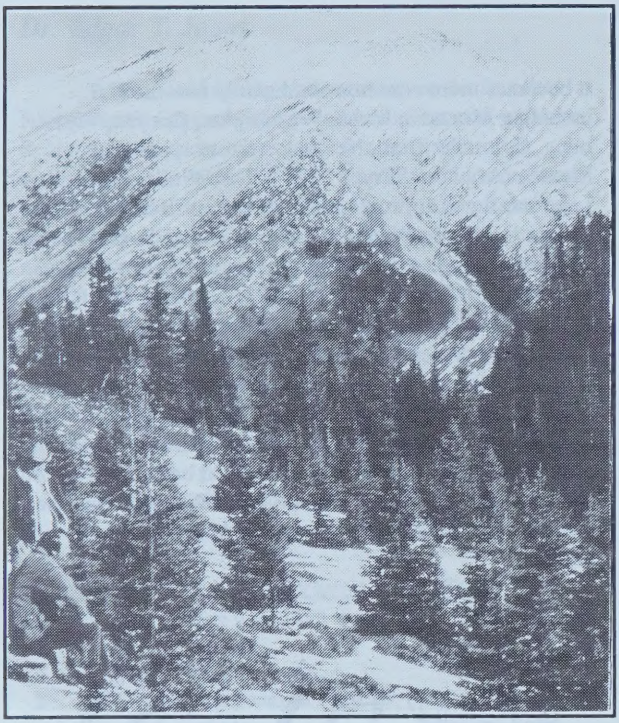


Figure 1. Mountain gentian *(Gentiana calycosa)*. (Taken from Vascular Plants of the Pacific Northwest, Hitchcock et al. 1977.)



Habitat of mountain gentian at Window Mountain Lake.
Photo: J.D. Johnson

Acknowledgement

I thank Don Stiles for making me stop and take a closer look at this plant. If not for him, I might have ignored it completely.

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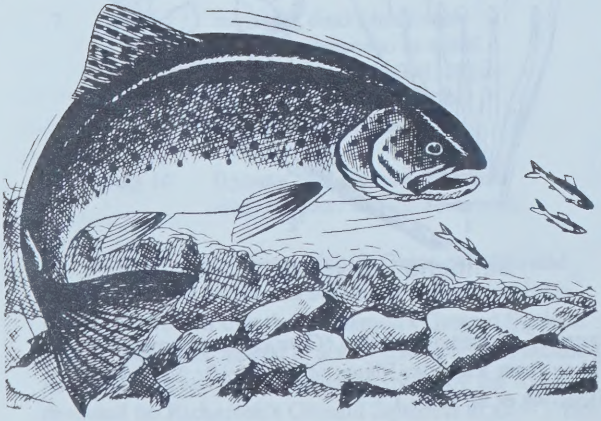

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Fall Migrant Vireos and Wood Warblers at Lethbridge

Ross Munro

On September 25, 1993, I was delighted to discover a Chestnut-sided Warbler in the Oldman River valley at Lethbridge. I did not recognize the bird at first but I quickly noted four distinctive field marks: the back was yellow-green, the underparts including the undertail were white or light grey, the face was grey, and there were two pronounced wing bars. The bird was observed later that day by five other careful and competent birders. As far as I know, this is the first documented record of a Chestnut-sided Warbler in the Lethbridge region. The sighting added an appropriate finishing touch to a very exciting wood warbler and vireo migration at Lethbridge.

The season had an auspicious beginning. On August 16, Julia Millen saw a Canada Warbler in a residential part of town. This was an exciting discovery! No one I spoke to could recall seeing this species before at Lethbridge. The next day I spotted another Canada Warbler in the river valley just outside the Helen Schuler Coulee (Nature) Centre. Other migrants appeared the same day in small numbers: Wilson's Blackpoll and Tennessee Warblers, and an American Redstart. The next day Laure Neish observed the first Townsend's Warbler, and she discovered a Northern Waterthrush skulking under a pygmy forest of caragana.

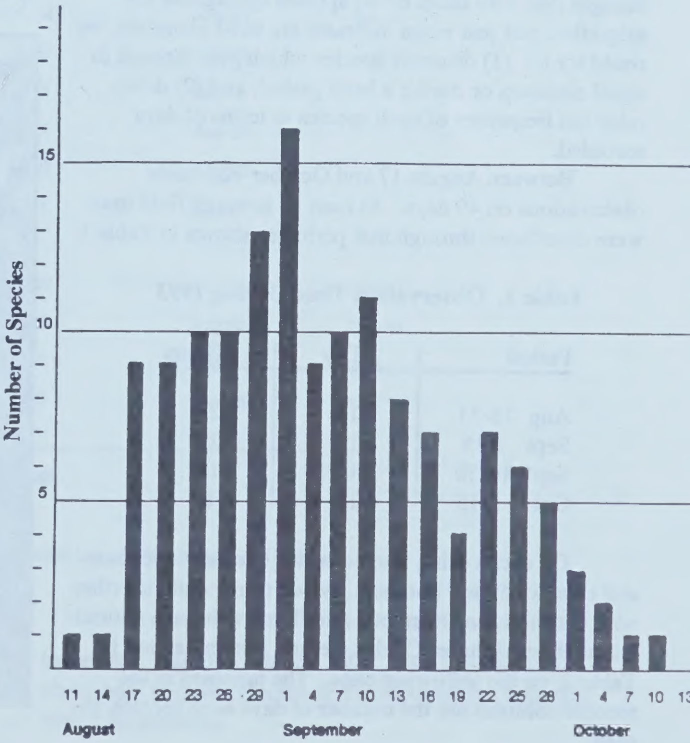
This was the beginning of a sustained wave of wood warblers and vireos. Every few days something new appeared: Yellow-rumped and Orange-crowned Warblers on August 19, the first Magnolia Warbler on August 23, a MacGillivray's Warbler and a Connecticut Warbler on August 27. Eleven species were seen on the 29th and again on the 31st. This migrant wave finally reached a peak on September 1. Conditions on that day were cool and overcast and it had rained overnight. But the Lethbridge Nature Reserve was alive with birds. Laure Neish came in at morning coffee break and announced "Cape May alert". We rushed out and quickly found the bird again. It turned out to be the only record of a Cape May Warbler and I observed the only Red-eyed Vireo of the fall migration. By the end of the day I had recorded 14 species! The weather cleared overnight and, as I noted in my journal, the Nature Reserve was a much quieter place on the morning of September 2. Only 4 species were recorded that day. The graph of species numbers show a more or less steady decline after the beginning of September.

The last few days of August and the first few of September held some other surprises. I recorded the first Bay-breasted Warbler on the evening of August 31. And several times the next day I saw the same bird or another one or most likely a few of them. Individual Solitary Vireos, too, were seen from August 30 to September 1. Both of these species were not seen outside of this brief peak period. Wilson's Warblers showed a very definite peak in numbers at this time, too. The following excerpts from my notes tell the story:

> August 24. 7:30-8:30 am. "Wilson's Warbler (WW) quite abundant - saw 10-20." August 29. 1:30-3:30 pm and 5:00-7:00 pm. "WW is undoubtedly the most abundant warbler in the Nature Reserve right now." August 31. 5:00-7:00 pm. "WW are especially numerous. They seem to be everywhere. It's not unusual to see four or five at once." September 5. 12:00-1:00 pm. "several WW". September 7. 8:00-11:00 am. "two or three WW (Wilson's numbers down dramatically from a week ago!)"

The species continued to be recorded in decreasing numbers until September 23.

Number of species recorded during three day intervals



Dates mark the middle of each three day interval

There were only three first of season records after September 1. On the 7th I observed the first Palm Warbler. It was an adult still in bright breeding plumage. Palm Warblers were seen on several days in small numbers during the rest of September. An Ovenbird was seen on September 10 and I observed one, perhaps the same individual, two days later. And finally there was the Chestnut-sided Warbler. This may have been an errant individual. But it is also possible that this species, like some of the other rare migrants, passes through regularly but in small numbers.

Background

At the beginning of August, 1993, I had set out to record on as close to a daily basis as possible the vireos and wood warblers passing through Lethbridge. The impetus for this project came in the autumn migration of 1992. During that season we recorded 15 wood warblers and four vireos (see Table 2). Some species such as Mourning Warbler, Ovenbird, and Philadelphia Vireo were recorded on only one or two days. Observations were not carried out in any systematic way, however, throughout the migration. My own efforts amounted to about 15 hours in the field, most of it in September. I thought that with more effort applied throughout the migration, not just when migrants are most abundant, we could try to: (1) discover species which pass through in small numbers or during a brief period; and (2) determine the frequency of each species in terms of days recorded.

Between August 17 and October 12 I made observations on 49 days. At least 75 hours of field time were distributed through that period as shown in Table 1.

Table 1. Observation Time During 1993

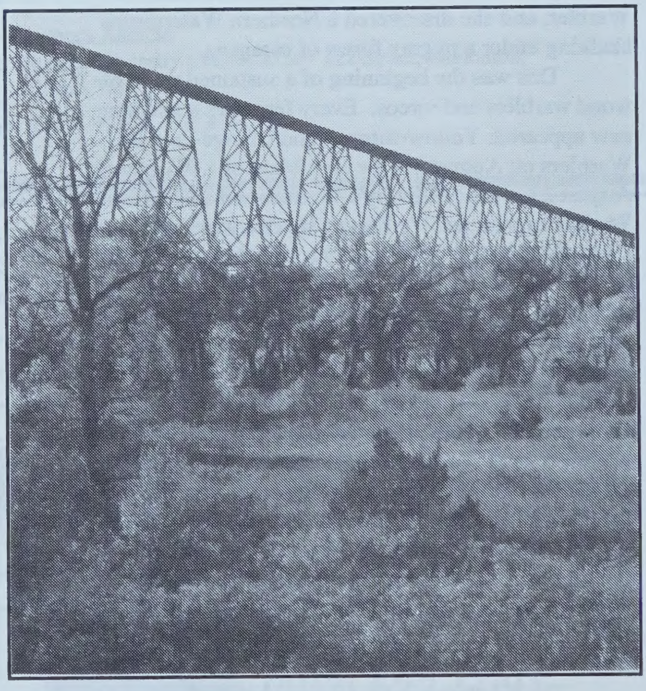
Period	Day	Hours
Aug 16-31	11	21
Sept 1-15	13	27
Sept 16-30	14	19
Oct 1-15	11	8

On each outing I noted which species were seen and estimated their numbers. Much of my data, together with contributions from other staff and volunteer naturalists at Helen Schuler Coulee Centre, is summarized in Table 2, on the following page. The numbers in the records columns are the number of days each species was seen.

Discussion of Findings

The table shows that a majority of our migrant vireos and wood warblers were uncommonly to rarely seen during the two years. Eight species were recorded in only one season. Fourteen (56%) were seen on no more than five days in either year. They account for only 12% of the records. Furthermore, none of these fourteen species was seen in large numbers. If we had good measures of the numbers of each species passing through, these fourteen would, I think, together constitute considerably less than 12% of the total. It is not surprising that some of these species have in the past been observed infrequently or not at all. Cape May and Bay-breasted Warblers, for example, passed through in small numbers, during a brief period and accompanied by other more abundant and conspicuous species.

With the increased effort in 1993, several more common migrants such as Warbling Vireo and Tennessee Warbler were recorded much more frequently. In contrast, Wilson's Warbler was seen on about the same number of days each year. Wilson's Warbler is a species that is difficult not to notice, at least on migration. It is brightly coloured, moderately curious, and tends to be at eye level or lower much of the time. Warbling Vireo and Tennessee Warbler are more cryptically coloured, somewhat less curious, and are often overhead in trees. In short, they are less conspicuous and require more persistence to find.



Most of the observations were done in the Lethbridge Nature Reserve shown here with the high level train bridge towering over it. The riparian poplar forests and shrubby meadows provide a variety of insect environments. For insect-eating migrants like vireos and wood warblers, these reparian forests

Table 2. Vireos & Wood Warblers recorded at Lethbridge after August 1 during 1992 and 1993.

SPECIES	1992 RECORDS	1993 RECORDS	EARLIEST RECORD	LATEST RECORD
Yellow-rumped Warbler	31	45	Aug 3	Oct 11
Wilson's Warbler	28	31	Aug 17	Oct 6
Orange-crowned Warbler	13	30	Aug 19	Oct 4
Yellow Warbler	14	24	*	Sep 13
Blackpoll Warbler	10	22	Aug 17	Sep 22
Tennessee Warbler	5	21	Aug 17	Sep 28
American Redstart	7	18	Aug 17	Sep 21
Common Yellowthroat	7	13	*	Oct 6
Townsend's Warbler	8	8	Aug 18	Sep 17
Palm Warbler	1	10	Aug 26	Sep 28
Magnolia Warbler	4	5	Aug 23	Sep 14
MacGillivray's Warbler	3	5	Aug 27	Sep 15
Black and white Warbler	4	3	Aug 22	Sep 14
Canada Warbler	0	3	Aug 16	Aug 29
Ovenbird	1	2	Aug 27	Sep 12
Bay-breasted Warbler	0	2	Aug 31	Sep 1
Northern Waterthrush	0	2	Aug 17	Aug 18
Cape May Warbler	0	1	Sep 1	
Connecticut Warbler	0	1	Aug 27	
Mourning Warbler	1	0	Aug 22	
Chestnut-sided Warbler	0	1	Sep 25	
Warbling Vireo	5	15	*	Sep 11
Solitary Vireo	4	3	Aug 22	Sep 11
Red-eyed Vireo	2	1	Aug 22	Sep 1
Philadelphia Vireo	2	0	Aug 26	Sep 14
TOTALS	150	266		

* No earliest migration dates are given for these species because they also breed locally.

In the Future...

The results so far raise some interesting questions. In what numbers do each of these migrants pass through Lethbridge? Do the numbers vary much from year to year? Is the migration peak observed in 1993 a regular event? Does it occur around the same time each year ? Does it coincide with a numbers peak? A capture and banding program would provide some answers. We are tentatively planning this for 1994. Any information about how to most effectively carry out such a program would be welcome.

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A Quarter Century Of A Quarter Past Four In The Morning— The Breeding Bird Survey in Alberta

Jack Park[1] *and Dave Ealey*[2]

Introduction

If people were to tell you that every summer they looked forward to getting up at 2:00 a.m., driving madly to a distant location and standing at the side of the road at 50 separate sites along a 40-km stretch of road and over a period of 5 hours, just to listen to a bunch of birds, would you start to look for white straitjackets? Not to worry!! Such enthusiasts are not certifiably around-the-bend; in fact, they are just taking part in the annual Breeding Bird Survey.

In 1992, this continent-wide survey involved participants running at least 2501 routes, of which 238 occurred in Canada and 68 in Alberta. The year 1992 was a landmark for Alberta, not only did we complete our first quarter century of these surveys, but it resulted in the single greatest increase in number of routes run (20 more routes than in 1991).

It's time to take stock of how far we've come along, and maybe speculate on where the survey is going. This article is the first in a short series about the Breeding Bird Survey in Alberta, and will cover the background and history, the trends in bird records, and the participants.

But what exactly i̲s̲ the Breeding Bird Survey? How did it get started? Why is it conducted the way it is? Who coordinates it? What use is the data?

What Is the Breeding Bird Survey

The survey provides a measure, using the skills and energy of amateur birdwatchers primarily, that documents the populations of breeding birds across North America. It has involved a number of people, since its beginnings in 1965, who have dealt with all aspects of study design, fieldwork procedures, coordination of the participants, and data compilation and analysis. Every aspect of the survey is important, but without the keen participation of the small army of volunteers who conduct the fieldwork, there would be no data for researchers to analyze.

History

Indexes based on auditory counts have been used to monitor upland game bird populations for decades in North America. The method was first reported for bobwhites in 1931, mourning doves in 1939, ring-necked pheasants in 1945 and ruffed grouse in 1953.

Chandler Robbins, as the songbird biologist for the U.S. Fish and Wildlife Service, investigated ways, from 1946 onward, to use volunteer efforts to monitor songbirds. Many techniques were suggested like mapping census plots, which was too time-consuming, and like mist netting, which sampled only the lower 2-3 m above the ground. When Robbins tried out the Breeding Bird Survey techniques in Maryland and Delaware in 1965 as a pilot project, the results were so impressive that a second biologist was hired the next year to help with the survey. In 1966, about 600 routes were run in the eastern United States and Canada. By 1979, the routes were averaging about 1850 routes run annually.

In Canada, efforts were largely spearheaded by Tony Erskine, Canadian Wildlife Service. At the annual August meeting of the American Ornithologists' Union held in Ohio in 1965, Chandler Robbins asked if Tony could find an observer for each degree-block in the Maritimes. Tony's efforts led to 33 routes being run in 1966, covering 21 of the 22 degree-blocks in the Maritimes. Only three routes were run in Quebec that year and Ontario had none. Ontario and Manitoba started in 1967, Alberta in 1968. Five routes were completed in Alberta that first year, and of those five routes, two are still run by the same observers—route #007, Brooks, by Ian Halladay and route #40, Thunder Lake, by Jack Park.

Fieldwork and Route Selection

As described above, the field portion of the survey does require the observer (and often an assistant) to rise early, drive to the start of a route and stand at several stops at the side of the road. The time of starting is precisely determined to be a half-hour before sunrise, so that during the 4 to 5 hours of the survey, the observer will cover the time of day when the majority of birds are most actively singing. In Alberta, because of the size of our province and the angle of the sun during the summer, the starting time varies from 3:52 a.m. in the northeast to 5:00 a.m. in the southwest (Figure 1).

To cover a useful sample that is also manageable, the routes extend for 40 km (approximately). They were designed to be 24.5 miles long, with a stop every half-mile (0.8 km), for a total of 50 stops. With the acceptance of the metric standard in Canada, and the prevalence of vehicles with odometers measured in kilometres, it can be a little awkward to keep track of stops. However, most agricultural land in Alberta has cross-fences on the mile and half-mile, which help to locate the same stops year after year.

Routes were chosen randomly to occur within each degree-block of the province where there were secondary roads. Primary roads were excluded because they are unsafe for the observer and vehcile noise is too great for effective listening. A degree-block is the area marked out by one degree of latitude and one degree of longitude (see Figure 1). Each route is set up, in advance, to follow a specific direction (N, S, E or W), with deviations allowed if the available road changes in direction. Additional routes have been selected within the degree-blocks, but generally the coverage is sparse (1-2 routes per degree-block) throughout western North America, compared with New England and some middle Atlantic states, which have dense coverage (12-16 routes per degree-block).

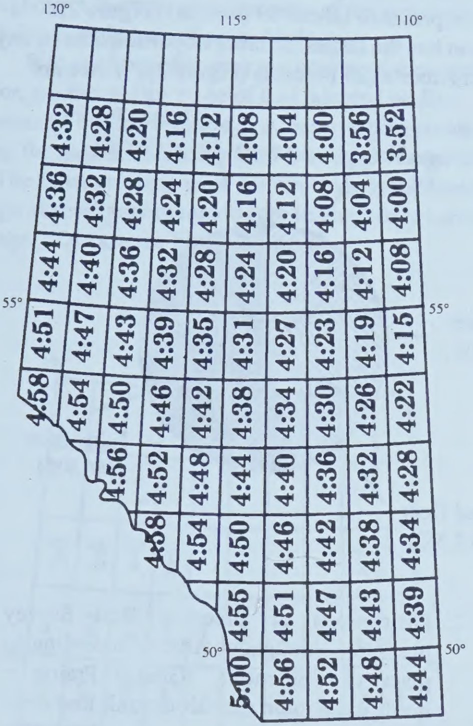


Figure 1. Starting times designated for Breeding Bird Survey routes within each degree-block in Alberta. Times are all ½ hour before sunrise.

At each stop, the observer must record, during a 3-minute period, all birds seen within a quarter-mile (0.4 km), and all birds heard regardless of the distance. Many observers have an assistant who helps by recording on data sheets the birds that the observer detects. Obviously the observer must be able to identify the birds on sight and by ear. This detection work can be quite challenging when you first step out of your vehicle and hit a wall of bird calls and songs! Roadside sloughs with emergent vegetation can be among the toughest spots to survey, what with the ducks on the water, other waterbirds hiding in the vegetation, flycatching songbirds and larids passing over the water in large numbers, and sparrows and warblers singing from the grassy and shrubby margins. Your 3 minutes can pass by amazingly quickly!

Coordination

The approximately 2000 participants in the Breeding Bird Survey across North America are coordinated by the U.S. Fish and Wildlife Service and Canadian Wildlife Service. In addition, each province has a provincial coordinator who is responsible for recruiting participants, checking whether surveyors are able to complete their routes, providing encouragement and assistance should problems arise regarding route locations, etc., and sharing information about interesting bird phenomena. Alberta's first provincial coordinator was Richard Fyfe, Canadian Wildlife Service. He was soon followed by the senior author, Jack Park, who has remained the provincial coordinator ever since.

Jack has been able to pass on information about bird trends almost as they occur because he requests copies of each participant's results. Recently, after an extensive caterpillar infestation in Alberta, Jack was able to confirm by midsummer that a rise in black-billed cuckoo numbers was occuring in the province, at least in the vicinity of survey routes.

Maps, instructions and data sheets are retained by the national coordinators before and after the survey period. They check for possible errors caused by recorders filling out the data sheets. For the data to be useful, any errors of bird numbers entered in the wrong data columns must be eliminated.

Continual refinements are being made to the communication between the participants and the coordinators. Each year, Canadian participants get copies of the previous breeding season's bird summaries for North America and Canada. Newsletters are also sent that keep surveyors up-to-date about how many routes are run, changes in coordinators and, a favorite of many, tales from the field, i.e., stories of incidents experienced by fellow surveyors. As you might imagine, there is no shortage of humorous incidents from 5 o'clock in the morning.

Data Analysis

The original purpose of the Breeding Bird Survey was to identify population trends of breeding birds over both the long term and the short term. The data have been extensively analyzed for this purpose on an ongoing basis. A review of the entire North American data base for the first 26 years is planned.

Because the data have been gathered in a uniform manner, they have been useful in identifying range extensions and contractions, effects of severe weather, the species composition of breeding bird populations in various ecological regions, and correlations of bird populations with habitat. In addition, Breeding Bird Survey data have been used in environmental evaluations, in research into island biogeography, in developing breeding bird atlases and in estimating continental bird populations.

In Alberta, the recent book *The Atlas of Breeding Birds of Alberta* benefited substantially from the data of the survey. A few articles have already been published that deal specifically with data from Alberta (see references). Some examples of the bird records provided by the survey over the first 25 years will be included in a future article.

Participation in Alberta

Over the first 25 years of the Breeding Bird Survey in Alberta, 118 enthusiastic birders have taken part (see end of article). Only seven surveyors (6 percent) have conducted surveys for 20 years or more, another seven have surveyed for 10 to 19 years, 44 individuals (37 percent) have surveyed for 3 to 9 years, while just over half (60) have surveyed for only 1 to 2 years. Many of that last group have begun in recent years, which shows promise for the future of the Breeding Bird Survey in Alberta.

Each year, assigned routes are not completed because of many reasons—weather, health, new family arrivals, unforeseen route changes. On one occasion, the observer could not take part because he was helping to locate colleagues downed in a plane in mountainous terrain. Rarely there are reasons of "other things came along, or we had no time, or it wasn't convenient." Generally though, observers in Alberta are very diligent in following through and completing their assigned routes. Following is a summary of 10 years of routes assigned:routes completed.

Year	Routes Assigned	Routes Completed	Proportion Done (%)
1983	31	26	84
1984	33	25	76
1985	38	30	80
1986	30	25	83
1987	36	32	89
1988	37	31	84
1989	48	40	83
1990	54	43	80
1991	60	48	80
1992	81	68	84

The majority of Alberta participants have been males (84 percent), which reflects the predominance of men in most birding clubs. Expansion of Breeding Bird Survey coverage would benefit from encouraging more women to become involved as participants, especially since their hearing is more acute than men's in the range of birds' songs.

Recent participants largely come from the central part of the province (about 59 percent) (Figure 2). Edmonton has the largest number of participants of any centre in Alberta (25 percent) (Figure 3). There are

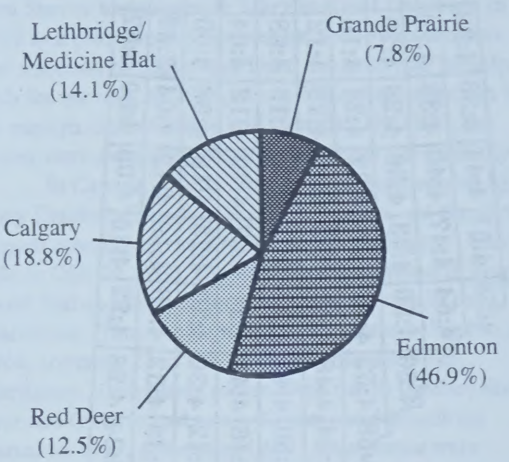


Figure 2. Distribution of Breeding Bird Survey observers throughout Alberta according to place of residence. (Grande Prairie = north; Edmonton = north-central; Red Deer = central; Calgary = south-central; Lethbridge/Medicine Hat = south.)

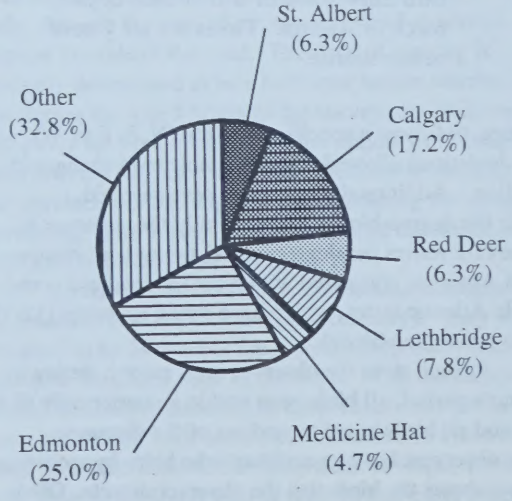
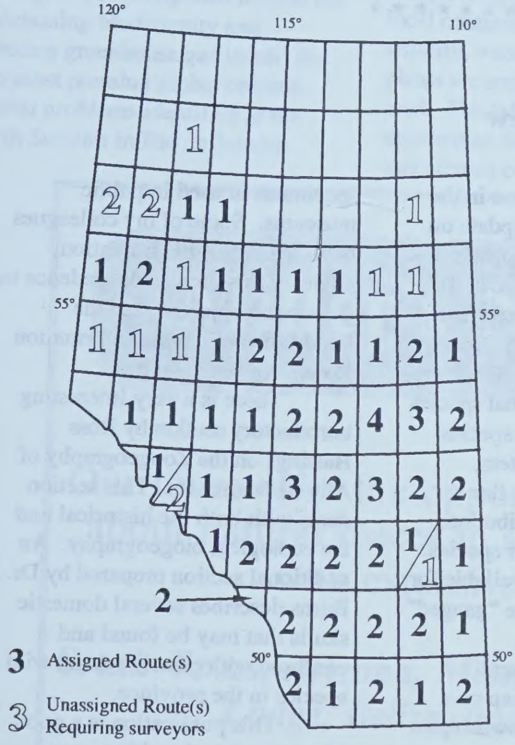


Figure 3. Population centres in Alberta with three (3) or more Breeding Bird Survey observers.

likely many reasons for the distribution of observers in the province. More people may be aware of the survey in and around Edmonton because of the involvement of the provincial coordinator in the Edmonton birding community. The routes may also be particularly interesting in the central parts of the province—birds are more varied; the topography and habitat, especially wetlands, more diverse. However, the need for monitoring of birds throughout Alberta is great because of the apparent declining populations of some birds.

It is our hope that over the course of the coming winter, we can entice more of that talented birding community we know exists in Alberta to take part in filling the gaps in Breeding Bird Survey coverage (Figure 4). The most pressing need for coverage is in the north, though several prairie regions are inadequately surveyed. Perhaps YOU are the birder we need!



Note: Not all assigned routes are completed each year.

Figure 4. Distribution of established Breeding Bird Survey routes in Alberta.

Breeding Bird Survey Participants Since 1968

Participants and the number of routes [R] and number of years [Y] that each has surveyed during the first 25 years of the Breeding Bird Survey in Alberta: James Allen [1R, 1Y], Gary Anweiler [1R, 3Y], Peter Assman [1R, 2Y], Darren Banasch [1R, 1Y], Dennis Baresco [1R, 1Y], Barb Beck [1R, 3Y], Jim Beck [1R, 1Y], Susan Benoit [1R, 2Y], David Boag [1R, 1Y], Rick Bonar [2R, 1Y], Ray Bouchard [1R, 1Y], John Bovell [1R, 1Y], G. Bradd [1R, 1Y], Scott Bricker [1R, 1Y], Gerry Bulmer [1R, 5Y], Christie Butt [1R, 2Y], Hugh Campbell [2R, 4Y], Lu Carbyn [1R, 1Y], Bob Carroll [1R, 1Y], Doug Collister [3R, 9Y], Sheila Cox [1R, 3Y], David Cuthiell [1R, 10Y], Peter Demulder [1R, 22Y], Luke DeWit [1R, 3Y], Ross Dickson [3R, 3Y], Theresa Dolman [3R, 7Y], Richard Donahey [1R, 2Y], M.E. Dyer [1R, 1Y], Dave Ealey [5R, 11Y], Rainer Ebel [1R, 4Y], Mrs. C.B. Ellis [1R, 1Y], Tony Erskine [1R, 1Y], Ernie Ewaschuk [1R, 1Y], Leland Ferguson [1R, 1Y], Cam Finlay [2R, 3Y], Joy Finlay [1R, 1Y], Warren Finlay [4R, 13Y], Frank Fraser [1R, 1Y], Rob Gardner [1R, 3Y], Bob Goddard [1R, 1Y], Jim Goodwin [1R, 3Y], Loran Goulden [3R, 2Y], Graeme Greenlee [4R, 22Y], Elizabeth Hall [2R, 7Y], Willis Hall [3R, 23Y], Ian Halladay [1R, 25Y], Miles Hennie [1R, 6Y], Alan Hingston [1R, 4Y], Geoff Holroyd [3R, 15Y], Phil Horch [1R, 7Y], Harry Horton [1R, 15Y], Odean Hoyme [1R, 2Y], Glen Hvenegaard [2R, 4Y], Mrs. H.L. Johnson [1R, 2Y], Harvey Johnson [1R, 14Y], Hope Johnson [1R, 1Y], Kate Jones [1R, 2Y], Stefan Jungkind [5R, 8Y], Cena King [2R, 8Y], Jessie Kinley [1R, 1Y], John Kinnaird [1R, 21Y], Virginia Lang [1R, 1Y], Don Lockhart [1R, 1Y], Lloyd Lohr [1R, 23Y], Ken Lumbis [1R, 8Y], David Lumley [1R, 3Y], Gerry Lunn [1R, 3Y], Simon Lunn [1R, 3Y], Avard Mann [1R, 1Y], Paul Marshal [1R, 7Y], Bill McKay [1R, 2Y], Gerry McKeating [1R, 3Y], Martin McNicholl [2R, 3Y], Don Mills [1R, 1Y], Jim Minty [2R, 6Y], Andrew Murphy [1R, 1Y], Lilian Neary [1R, 1Y], Jack Park [12R, 25Y], Myrna Pearman [2R, 5Y], Linda Pilarski [1R, 1Y], Jamey Podlubney [1R, 4Y], C. Pollock [1R, 2Y], Richard Quinlan [1R, 4Y], Robert Reid [1R, 1Y], Roy Richards [2R, 11Y], Blair Rippin [1R, 1Y], Hugh Ritz [1R, 1Y], A.D. Roberts [1R, 2Y], Irma Rowlands [1R, 1Y], Elizabeth Savoy [1R, 2Y], Helen Schuler [4R, 7Y], Bill Sharp [2R, 9Y], Peter Sherrington [1R, 6Y], John Shier [1R, 5Y], Herb Sivyer [2R, 5Y], Lori Skulski [1R, 1Y], Andrew Slater [2R, 8Y], Alan Smith [5R, 8Y], Darrell Smith [2R, 3Y], Hugh Smith [1R, 3Y], Ralph Smith [1R, 1Y], Wayne Smith [1R, 1Y], John Steeves [1R, 3Y], Robert Storms [1R, 1Y], Terry Thormin [2R, 2Y], Eric Tull [2R, 2Y], Bob Turner [1R, 8Y], Hank Vanderpol [1R, 4Y], James Washbrook [1R, 1Y], Terrance Waters [1R, 2Y], Wayne Weber [2R, 1Y], Chip Weseloh [1R, 3Y], Geoff White [1R, 1Y], Bill Wiebe [1R, 2Y], Kevin Wingert [1R, 1Y], Alan Wiseley [1R, 1Y], Jim Woolford [1R, 2Y].

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* *

Book Review

ALBERTA MAMMALS: AN ATLAS AND GUIDE

Hugh C. Smith
The Provincial Museum of Alberta
Edmonton, Alberta 1993
250 pp. $24.95.

"The first purpose of this current book is to provide a specific reference to those mammals that occur in Alberta and to provide a means whereby they may be identified. The second purpose of this book is to encourage the amateur naturalist and the professional biologist to fill the gaps in our knowledge of mammalian distribution, by depositing specimens in public natural history museums... . The final purpose of this work is to provide a checklist of the mammals that have been found in Alberta, and to provide their currently accepted English common names and their scientific names."

The author states these purposes for the publication in the introduction of this first update on Alberta mammals since Soper's The Mammals of Alberta in 1964. To meet the first objective, excellent keys are provided for each Order to help identify the species. These are complimented by individual species accounts that include the species name, identifying characters, measurements (including line drawings of skulls), distribution, habitat, status and similar species. Color photographs are available for most species but these are "ganged" in the centre of the book.

Each species account includes a distribution map on a provincial base map of townships and ranges. The distribution maps "represent the best estimate of the distribution of a species in the province. Data from collected specimens are supplemented by published reports to delineate estimated ranges". The point specific information is restricted to specimens housed in public museums. Some of my colleagues have criticized this limitation, however this then leads credence to the second objective and the importance of having information stored in a common base.

There is a very interesting introductory section by Ross Hastings on the Zoogeography of Alberta Mammals. This section deals with both the historical and the ecological biogeography. An additional section prepared by Dr. J. Burns describes several domestic skulls that may be found and confused with closely related wild species in the province.

This publication is a good educational tool and is recommend ed as a standard reference for mammals in the province. It is available at most book stores or directly from the Provincial Museum of Alberta in Edmonton.

Glen Semenchuk

Magazine Review

Applied Ecology - The Newsletter of Environmental Solutions

Godo Stoyke (Editor). 1993. Centre for Applied Ecology, Edmonton, 12 pages. ISSN 1192-7887.
Cost $10.95/year (four issues, no GST).

Applied Ecology: The Newsletter of Environmental Solutions is a new publication which provides practical information on the environment of individuals, environmental groups, businesses, and schools. The focus of *Applied Ecology* is providing information for maintaining biodiversity and reducing greenhouse gas levels, the two most pressing global environmental problems identified at the Earth Summit in Rio de Janeiro.

The Newsletter, the only of its kind in North America, provides practical advice on reducing greenhouse gas levels. Information ranges from energy efficiency and fuel conversion to a critical examination of available products. Most of the best energy-efficient technology is less than one year old; these developments are reviewed in *Applied Ecology*. Reports describe which methods and techniques are most effective in halting global climate change.

Advice on creating wildlife habitat is useful for private gardens, company and school lawns, and the local community. Attracting native wildlife, water gardens, and native plants are some of the topics covered. The information provided is appropriate for Alberta ecosystems and climate conditions.

Articles are referenced, and appropriate for home and office use, environmental and public interest groups, and as curricular supplements.

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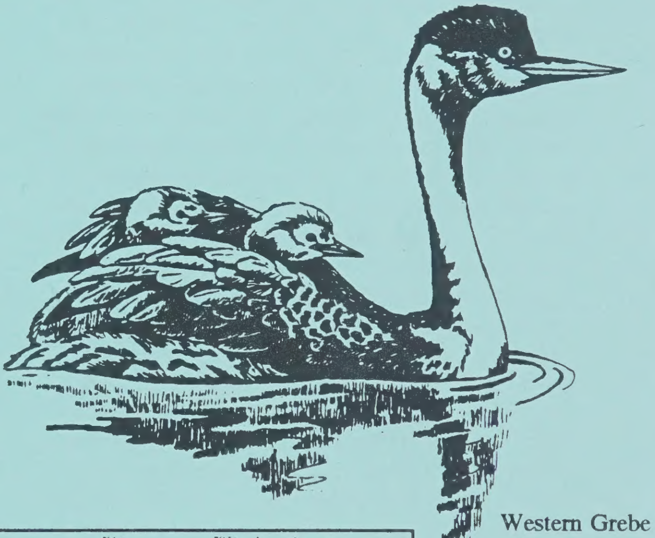
Supplement Number 4

Alberta Naturalist Volume 23, Number 1

Results of the 1992 May Species Count - Plants in Flower

1992 May Species Count for Birds and Mammals

Early Blue Violet
Viola adunca



Western Grebe
with family

Bear with cubs

Results of the 1992 May Species Count - Plants in Flower

J. Derek Johnson

Following are the results of the botanical portion of the 1992 May Species Count, held May 30-31. The areas from which reports were received have been listed in approximate latitudinal order from south to north. Scientific nomenclature in this report follows Moss (1983); common names have been taken from Looman and Best (1979), where available.

It turned out to be a record-setting year for the May Species Count in 1992. About the only previous record that was not equalled or surpassed was the number of participants, 124, and that was only eight people short of the 1990 record of 132. The number of reports submitted was at an all time high of 59, exceeding the 1990s record of 46. The total number of species reported in flower increased from 336 in 1991 to 440 this year, also a record total, exceeding by three the 437 species reported in 1988. The higher number of species reported in flower was due to an earlier spring and a greater number of reporting areas. Spring was the earliest it has been since 1987. Geographic coverage within the province was the best it has ever been, with considerable lumping of areas being necessary to get down to the 20 areas reported here. Cypress Hills was back this year after a one year absence from the count, but no report was received from Stettler, the first time ever that they have missed a count. Whiskey Gap led all count areas, reporting 169 species in flower, the most ever for a single count. The Edmonton area came second, recording 150 species in flower. Waterton Lakes National Park followed with 130 species. Cypress Hills Provincial Park was fourth with 119 species. Six count areas, Waterton, Whiskey Gap, Cypress Hills, Medicine Hat, Entwistle, and Glenevis set new all-time highs for the number of species seen in flower. All other regular count areas were above average.

Weather on the count weekend was almost a carbon copy of the weather in 1991. Sunday again proved to have better conditions than did Saturday. Rainshowers and cool conditions were reported from most areas on Saturday morning, with general improvement in the afternoon. Sunday was sunny and warm with very little wind over most of the reporting areas. Spring was slightly ahead of average in 1991. Conditions were more variable in 1992, with the central and northern areas starting out early, but receiving a setback with the mid-May snowstorm. The snow missed the southern areas and conditions were very dry. Central and northern areas were about a week ahead of average; southern areas were at least two weeks ahead. A tour across the southern prairies revealed that many of the grass species had headed out, but had then dried out before the flowers opened. More species should have been in flower considering the earliness of the season.

Twenty-nine new species were added to the all-time May Count list this year; this is the most since 1988. Seventeen of these species came from the Waterton Lakes National Park and Castle River areas. Over the past four years the Waterton count has added 28 species to the all-time May Count list. New species this year included: *Disporum hookeri* (Oregon Fairybells), *Cypripedium montanum* (Mountain Lady's-slipper), *Minuartia obtusiloba* (Sandwort), *Bupleurum americanum* (Thorough-wax), and *Cirsium hookerianum* (White Thistle) from Waterton; *Viola macloskeyi* (Macloskey's Violet) from Waterton and the West Castle River; *Eriogonum umbellatum* (Umbrellaplant), *Potentilla glandulosa* (Sticky Cinquefoil), and *Valeriana sitchensis* (Mountain Heliotrope) from Waterton and the South Castle River; *Angelica dawsonii* (Yellow Angelica) from Waterton, the West Castle and South Castle rivers; *Sagina saginoides* (Mountain Pearlwort), *Mitella pentandra* (Mitrewort), *Pachistima myrsinites* (Mountain Lover), and *Vaccinium scoparium* (Grouseberry) from the West Castle River; *Veronica serpyllifolia* (Thyme-leaved Speedwell) from the West Castle River and the Cypress Hills; *Phacelia hastata* (Silver-leaved Scorpionweed) from the South Castle River; *Senecio streptanthifolius* (Northern Ragwort) from the South Castle River and Grande Prairie; *Viola arvensis* (Wild Pansy) from Police Outpost Provincial Park; *Alopecurus carolinianus* (Carolina Foxtail), *Deschampsia cespitosa* (Tufted Hair Grass), and *Carex athrostachya* (Long-bracted Sedge) from Whiskey Gap; *Astragalus kentrophyta* (Prickly Milk-vetch) from Writing-on-Stone Provincial Park; *Lomatium cous* (Biscuit-root) from the Cypress Hills; *Amaranthus graecizans* (Prostrate Amaranth) and *Verbena bracteata* (Carpet Vervain) from Medicine Hat; *Erigeron scotteri* (Cliff Daisy) from Yamnuska; *Potentilla hookeriana* (Hooker's Cinquefoil) from Mount Lorette Natural Area; *Anemone richardsonii* (Yellow Anemone) from Banff; and *Scirpus pumilus* (Dwarf Bulrush) from Campbell Springs, north of Mayerthorpe. Mountain Lover and Carpet Vervain also represent new families for the count (*Celastraceae* and *Verbenaceae*, respectively). It was relatively easy to accept reports of new species this year; only the reports of Mountain Lady's-slipper, Yellow Anemone, Hooker's Cinquefoil, and White Thistle were not supported by either a specimen or a photograph. To find any species of thistle (*Cirsium*) in flower by the end of May is highly unusual. I would not have accepted the record of *Cirsium hookerianum* (White Thistle) from Waterton if not for the fact that it was reported independently from two different areas of the park by two different groups.

Viola macloskeyi (Macloskey's Violet) is apparently known in Alberta only from Waterton Lakes National Park (Kuijt 1982; Packer and Bradley 1984). The occurrence along the West Castle River pushes its distribution in Alberta slightly northward. The record of *Alopecurus carolinianus* (Carolina Foxtail) from Whiskey Gap is particularly noteworthy. To my knowledge it represents only the second reported occurrence of this species in Alberta, the first being from Vauxhall. *Lomatium cous* (Biscuit-root) is one of the rarest plants in Alberta. It is only known to occur on dry hillsides in the Cypress Hills (Packer and Bradley 1984). Regardless of your taxonomic persuasion, the report of *Erigeron scotteri* (Cliff Daisy) from Yamnuska represents a new species for the count. Moss (1983) would include this record in *E. acris* (Northern Daisy Fleabane), but the specimen submitted keyed out well to *E. scotteri* as defined by Boivin (1972), and for reporting purposes I have decided to follow Boivin's concept. *Scirpus pumilus* (Dwarf Bulrush) is an uncommon species in Alberta, distributed primarily in fens along the mountains, with a couple of outlying occurrences in the Edmonton region.

In addition to the high number of species reported for the first time, the earliness of spring in 1992, was evident in the high number of species reported for only the second time, particularly in the southern prairie. First records for many of these species occurred in the exceptionally early springs of 1987 or 1988. *Scirpus microcarpus* (Small-fruited Bulrush) was first reported from two nearby areas, Edmonton and Entwistle, in 1988. This year it was found in two widely separated areas, Writing-on-Stone Provincial Park and Glenevis. *Astragalus eucosmus* (Milk-vetch) was first reported in flower from Fort McMurray in 1981; this year it was found in two areas, Mount Lorette Natural Area and Edmonton. The first reports of *Pedicularis groenlandica* (Elephant-head) in flower came from Yamnuska and Banff/Canmore in 1987. This year it was again reported from these areas, as well as Calgary. *Hymenopappus filifolius* (Tufted Hymenopappus), first reported from Whiskey Gap in 1987, was found in two areas this year, Whiskey Gap and Writing-on-Stone Provincial Park. Additional interesting second time records are included with the area accounts.

There were a number of other records this year worthy of comment. *Camassia quamash* (Blue Camas) was first reported on the May Count in 1990 from Cardston. This year it was reported from three areas, Waterton, Police Outpost, and Whiskey Gap. It is considered to be a rare species in Canada (Argus and Pryer 1990). *Habenaria viridis* (Long-bracted Orchid) was reported from a record high six areas in 1992. *Polygonum bistortoides* (Western Bistort) was first reported on the May Count from Whiskey Gap in 1987. It showed up on four counts this year, Waterton, Police Outpost, Whiskey Gap, and Cypress Hills. This is anything but a common species in extreme southern Alberta and was quite unecpected. Conspicuous by its absence category is *Astragalus drummondii* (Drummond's Milk-vetch). I was most surprised when no report of this species being in flower was received this year. It is usually a reliable species being reported on the May Count. Checking the records, I found that this is the first time in 12 years, and only the fourth time in the 17-year history of the May Count, that it has been missing.

Twenty-one species considered to be rare in the province (Packer and Bradley 1984) were found in flower on the 1992 count. This is the most since Packer and Bradley's list was published. Interestingly, four of the rare species reported are violets. A record total of 12 violet species was reported on the 1992 count. Rare species, and the areas from which they were reported, include: *Disporum hookeri* (Oregon Fairybells), *Cypripedium montanum* (Mountain Lady's-slipper), and *Bupleurum americanum* (Thorough-wax) from Waterton Lakes National Park; *Viola glabella* (Yellow Wood Violet), and *V. macloskeyi* (Macloskey's Violet) from Waterton and the West

Castle River; *Castilleja hispida* (Hispid Paintbrush) from Waterton and the South Castle River; *C. cusickii* (Yellow Paintbrush) from Waterton, Police Outpost Provincial Park and Whiskey Gap; *Pachistima myrsinites* (Mountain Lover) and *Lonicera utahensis* (Utah Honeysuckle) from the West Castle River; *Ribes inerme* (Mountain Gooseberry) from the West Castle River and Whiskey Gap; *Erigeron radicatus* (Dwarf Fleabane) from Whiskey Gap; *Astragalus kentrophyta* (Prickly Milk-vetch) from Writing-on-Stone Provincial Park; *Hymenopappus filifolius* (Tufted Hymenopappus) from Whiskey Gap and Writing-on-Stone; *Lomatium cous* (Biscuit-root) and *Osmorhiza chilensis* (Blunt-fruited Sweet Cicely) from the Cypress Hills; *Lupinus pusillus* (Annual Lupine) from Medicine Hat; *Viola pedatifida* (Crowfoot Violet) from Red Deer; *V. selkirkii* (Great-spurred Violet) and *Osmorhiza longistylis* (Smooth Sweet Cicely) from Edmonton; and *Cypripedium acaule* (Stemless Lady's-slipper) and *Polygala paucifolia* (Fringed Milkwort) from Fort McMurray.

Unlike new records, dealing with count results as a whole this year was the greatest challenge it has ever been. The problem of sorting through questionable flowering records and probable misidentifications was particularly acute, because of the record number of reports. I have adopted a conservative approach in dealing with questionable records, not including the more questionable ones in this year's compilation, unless there was reasonable documentation or the reports came from a reliable observer.

Following is a list of observers, area totals (1991 in brackets), and other pertinent remarks for each area.

1. Waterton Lakes National Park: Waterton seemed to be the destination of choice this year with six reports, including eight participants, being submitted. Derek Johnson encountered 72 species in the Buffalo Paddock and Maskinonge areas on May 25. On the count weekend, 49 species were listed in flower by J.F. Dormaar from the Horseshoe Basin region. The Blakiston Fan, Akamina Parkway, lower end of Bertha Trail and Giant's Mirror were covered by park naturalist Janice Smith. She found 67 species in flower. Betty Haig and Sheila Petherbridge travelled the Vimy Trail recording 27 species. Teresa Dolman found 11 species in flower at Sofa Cirque and along the Belly River Road. Finally, Hazel and Gordon Ross traversed an area including the Red Rock Canyon Road, Pass Creek, Coppermine Creek and the Crandell Lake Trail, reporting 55 species in flower. The total number of species for the park was an impressive 130 (74), exceeding last year's record by almost 60 species.

After three years of wondering, it was nice to have a flowering record of *Disporum hookeri* (Oregon Fairybells) confirmed for the park. The report of *Eriogonum ovalifolium* from Waterton is the second for the May Count; the first came from the Frank Slide in 1988. This year's flowering record of *Sedum lanceolatum* (Lance-leaved Stonecrop) is also the second for the May Count, after the first report from the Ross Ranch along the Milk River in 1988. *Heuchera parvifolia* (Small-leaved Alumroot) was first reported from Whiskey Gap in 1988. The report from Waterton this year is the second for the May Count. *Astragalus pectinatus* (Narrow-leaved Milk-vetch) is reported as new to the park as it is not listed by Kuijt (1982).

2. West Castle/South Castle Rivers: Derek Johnson visited the West Castle River south of the ski hill and the slopes above the South Castle River north of the candidate Big Sagebrush Natural Area on May 24, finding a combined total of 88 species in flower. The finding of *Ranunculus inamoenus* in flower along the West Castle River is the first confirmed record for the May Count. There is one other, highly dubious record from Dry Island Buffalo Jump Provincial Park in 1978. Dry Island is well out of the range shown for this species in Moss (1983).

3. Police Outpost Provincial Park/Outpost Wetlands Natural Area: A trip by Derek Johnson to this area on the Alberta-Montana border on a very windy May 25 counted 60 species in flower.

4. Whiskey Gap: Thirteen grass species in flower helped swell the count total for this area to 169 (90), the most ever in the seven years that a count has been done in this area. The previous best was 163 in 1987. Barbara and Lynn Sommerfeldt and George and Etta Scotter were the participants. An interesting record for the area was that of *Plagiobothrys scouleri* (Scouler's Allocarya). The only other time that this species has been reported on the May Count was in 1985 from Pakowki Lake. Second time records for the area included *Festuca idahoensis* (Idaho Fescue) and *Potentilla arguta* (White Cinquefoil).

5. Writing-on-Stone Provincial Park: A pleasant but windy day revealed 64 species in flower to Derek Johnson on a visit to the park on May 26. In addition to the new and rare species, interesting records for the area included *Paronychia sessiliflora* (Low Whitlowwort), *Silene menziesii* (Menzie's Catchfly), and *Senecio congestus* (Marsh Ragwort). Low Whitlowwort has only been reported once before on the May Count and that was from Calgary in 1981. Menzie's Catchfly has been reported only twice before, from Head-Smashed-In Buffalo Jump in 1988 and from Writing-on-Stone in 1989. One forlorn plant of Marsh Ragwort was found on the muddy bank of the Milk River in the park. This is well removed from the main distribution of the species in Alberta (Moss 1983).

6. Lethbridge and area: Good coverage was achieved in this area with 10 reports being submitted, including 18 participants. Observations by Derek Johnson and Don Stiles from the F.A.N. Spring Meeting at the Helen Schuler Coulee Centre on May 23 have been included with the area results. They found 23 species in flower. On the count weekend, Linda Cerney and Paul and Joyce Wilkinson also visited the city's river valley, adding eight and two species, respectively, to the city total. Most of the reports submitted this year came from areas outside the city of Lethbridge. Lloyd Bennett did his second count in the Taber area, finding 44 (32) species in flower. Laure Neish added one species from Coaldale. Hazel and Gordon Ross covered the Old Whoop-up Trail and the St. Mary River south of the city, encountering 14 species in the process. Connie Goodall, Betty Haig, Lois McKillop, Doris Rhodes and Sheila Petherbridge recorded seven species in flower in the Pothole Creek and Magrath areas, south of the city. The Monarch area was covered by two groups; Francis and Arvid Schultz reported seven species, and Liz Savoy and Mike Klassen listed 23 species in flower, for an area total of 28. Liz and Mike also included Fort MacLeod in their travels, reporting 15 species in flower. The total number of species for the Lethbridge area was 71 (45). A second report of *Cardaria draba* (Heart-podded Hoary Cress) for the May Count came from this area this year; the first report was also from this area in 1985.

7. Porcupine Hills/Oldman River Dam: Derek Johnson visited the Oldman River Dam on May 24, logging 29 species in flower. The Porcupine Hills were included in Liz Savoy's and Mike Klassen's wide-ranging travels on the count weekend where they found 27 species in flower. The total number of species for this area was 48. *Lepidium ramosissimum* (Branched Peppergrass), found in flower near the Oldman River Dam, was first reported not far away at Head-Smashed-In Buffalo Jump in 1988.

8. Cypress Hills Provincial Park: Two reports came from the park. A general tour of the park on May 27 by Derek Johnson, including the Murray Hill Road, Horseshoe Canyon Viewpoint, Nichol Springs, Spruce Coulee Reservoir and Reesor Lake, revealed 87 species in flower. Coverage of the Elkwater to Reesor Lake area on May 30 by Margaret Walker and Doug and Sue Macdonald resulted in a list of 81 species in flower. The total for the park was 119, with far less overlap between the two lists than expected. One correction has to be made in the results of this count from 1984 to date. The species that has been reported as *Senecio congestus* (Marsh Ragwort) is actually *S. integerrimus* (Entire-leaved Groundsel), which was verified by a photograph this year.

9. Medicine Hat/Red Rock Coulee Natural Area: Plant counters were fewer, but enthusiasm was higher for this year's count in Medicine Hat. Only four participants took part. On the count weekend Dennis Baresco and two others recorded 35 species from the city in general. Derek Johnson's observations on May 28, mostly from Police Point Park, included 40 species in flower. The total for the city was 64 (55). A visit by Derek Johnson to Red Rock Coulee on May 26 revealed 25 species in flower. The total number of species for the Medicine Hat area was 68. *Chenopodium salinum* (Oak-leaved Goosefoot) was found in flower on the banks of the South Saskatchewan River in the city. This is only the second occurrence for the May Count; the first was from Buffalo Lake in 1988.

10. Calgary and area: For whatever reason, some of the Calgary people thought the May Count was being held on the weekend of May 23-24 this year. Because of this, the Calgary records cover the period from May 23-31. Also, because of the slip-up in Calgary, I felt no qualms about including reports from other areas of the province for the week prior to the count.

Six reports, representing eight participants, came from Calgary this year. Marilyn Strachan listed 10 (3) species in flower from an acreage just west of the city limits. Lowery Gardens and Edworthy Park were covered on May 24 by Ena Spalding who found 27 (27) species in flower here and 26 (26) species in the Springbank area, west of the city, on May 23. The University of Calgary Reserve (Beryl's Prairie) had a going-over by Ann Brebner; she recorded 35 species. Don Stiles travelled to three different areas, including his Red Deer Lake Bluebird Trail, the Bow River below Queensland, and Fish Creek Provincial Park between 24th Street and MacLeod Trail, listing 14, 38 (21) and 25 species in flower, respectively, from these areas. The Weaselhead area of Glenmore Park was visited by Derek Johnson on May 29. He located 49 species in flower. Suzanne Visser, John Corbin and Jamey Podlubny traversed the Paskapoo Slopes between Canada Olympic Park and Sarcee Trail, reporting 58 species in flower. The total number of species for the Calgary area was 97 (101).

11. Yamnuska/Kananaskis River/Mt. Lorette Natural Area: The Yamnuska count added a survey along the Kananaskis River to this year's results, giving them a total of 95 (64) species in flower, up considerably from last year. Participants in the count included Heather Dempsey, Deborah Hornsby, Doug and Miriam Leighton, Diane (compiler) and Mike McIvor, and Bob and Mary Smith. A count by Des Allen from the Mt. Lorette Natural Area in Kananaskis Country has been included with the area results. He found 63 species in flower, making the grand total for the area 111.

12. Banff/Canmore/Wind Ridge: The count from the Banff area also had an addition this year, a visit to C Level Cirque in Banff National Park. A wide-ranging effort by Gail and Bruce Bembridge, Vicki Connoy, Heather Dempsey, Halle Flygare, Marjory Gibney, Dorothy and Bob Haines, Albert Mazzucchi, Diane (compiler) and Mike McIvor, Mike Potter, Bob and Mary Smith, and Eva Zidek resulted in a list of 95 (55) species in flower, another big increase over last year. The report of *Ranunculus eschscholtzii* (Mountain Buttercup) from Banff is the first since a questionable report from Turner Valley in the very first year of the May Count in 1976. The report of *Chrysanthemum leucanthemum* (Ox-eye Daisy) from this area is the second for the May Count. The first came from Edmonton in 1981.

13. Red Deer and area: Participation in this area's count was a little better than average this year. Three reports were received, including 12 participants. Helen Harris (compiler), Jane Ming, Ilene Ford, and Kerry, Marjorie and Rondo Wood visited the Grassy Lake Natural Area, southeast of Red Deer, encountering 47 species in flower. Doug Taylor and a group of cottage owners from Burnstick Lake, southwest of Caroline, submitted a list of 44 species in flower. A brief visit to the Gaetz Lakes Sanctuary in Red Deer by Peter Achuff, Elisabeth Beaubien, Derek Johnson, Dan MacIsaac, and Joan Snyder compiled a list of 29 species in flower. The total number of species for the Red Deer area was 58 (47).

14. Coyote Lake: Doris and Eric Hopkins and Fran Losie reported 32 species in flower from this nature sanctuary approximately 67 km west of Leduc.

15. Edmonton and area: Twelve reports were received from the Edmonton area this year compared to 14 last year. Seven reports came from within the city limits; five came from outside the city, but within an 80 km radius. Broad area coverage kept the number of species reported in flower comparable to recent years. A total of 21 participants reported 150 (152) species in flower.

Within the city, two counts were done in Whitemud Ravine between 23rd and 45th Avenues. Derek Johnson and Elisabeth Beaubien found 51 (54) species in flower; Pat and Bill Wishart found 29. The University of Alberta campus and the north-facing bank of the North Saskatchewan River was one of seven areas visited by Patsy Cotterill on her wide-ranging travels. Here she encountered 19 (11) species in flower, including the rare *Osmorhiza longistylis* (Smooth Sweet Cicely). Edmonton is one of three areas in the province from which this species is known. The Edmonton locality is widely separated from the other two in southeastern Alberta. This species has been reported in flower from Edmonton once before, on the 1981 May Count. Patsy's visits to Patricia Ravine, Little Mountain Cemetery in north Edmonton, a peatland at 199th Street and 107th Avenue, and Laurier Park resulted in lists of 32, 38 (32), 35 (26), and 8 species in flower, respectively. A second report of *Eleocharis quinqueflora* (Few-flowered Spike Rush) for the May Count came from Edmonton this year. It was first reported from Whiskey Gap last year.

Outside the city, Elisabeth Beaubien, Judy Fairweather and Linda Kershaw surveyed an acreage near Hastings Lake, west of Tofield, recording 28 (33) species in flower. Kevin Timoney and Anne Robinson covered an acreage on the Cooking Lake moraine, listing 37 (33) species in flower. The Wagner Natural Area count yielded 52 (62) species in flower. Alice Hendry, Paul Sparrow-Clarke, Diana Barager, Aileen Rhodes, Elaine Gordon, Sharlene Becker, and Patsy Cotterill (compiler) were the observers on this count. Patsy also managed to cover the Clifford E. Lee Nature Sanctuary encountering 31 (31) species in flower. And finally, the MacIsaac family, Dan (compiler), Linda, Colleen, Andrew, and Keith, and Robert Vivian, visited the Chickacoo Lake Recreation Area, 10 km north of Stony Plain and found 37 (28) species in flower. It would seem that my admonition to observers to keep their eyes open for *Chrysosplenium tetrandrum* (Green Saxifrage) in addition to the more common *C. iowense* (Golden Saxifrage) paid off this year, with a specimen of the former being submitted from east of Edmonton, after its first occurrence on the May Count last year from Bragg Creek.

16. Entwistle: The fourteenth annual count in the area surrounding Hoople Lake, 8 km south of Entwistle along Highway 22, listed 77 (67) species in flower, an all-time record for the area. Three additional observers and more time spent searching the area are the primary reasons for the record number of species. Derek Johnson (compiler), Steve Zoltai, Ian Campbell, Ted Hogg, and Dave Price were the observers. Six new species were recorded, bringing the 14-year total for the area to 132. One of the new species was *Alopecurus pratensis* (Meadow Foxtail). It has spread rapidly in the Edmonton region since 1988. *Antennaria neglecta* (Broad-leaved Pussytoes) was back in flower this year after its mysterious disappearance last year. One surprising occurrence was an exceptionally late flowering catkin of *Salix planifolia* (Flat-leaved Willow).

17. Glenevis/Campbell Springs: Peter Achuff, Leslie Baker, Elisabeth Beaubien, Patsy Cotterill (compiler), Dave Cuthiell, Derek Johnson, Rayma Peterson, and three other members of the George Pegg Botanic Garden Society surveyed the former Pegg property 3 km north of Glenevis, finding 67 (36) species in flower. An earlier spring and more competent observers are responsible for this record number of species in the four May Counts that have been conducted at Glenevis. A few members of this group continued on to Campbell Springs, an area of calcareous springs approximately 13 km north of Mayerthorpe, recording 24 species in flower in this area. The total number of species for the region was 82. *Caltha natans* (Floating Marsh Marigold) was found in flower at Glenevis for the second time; the last time was in 1983.

18. Athabasca/Hanmore Lake/Bouchard Lake: Three reports covering four areas in this broad region NNE of Edmonton were received. Elaine and Arno Birkigt and family, Catherine and Robert Holmberg, Peter Opryshko and family, Merilyn (compiler), Geoff, and Ryan Peruniak, and Ann Stiles covered the Pine Sands Natural Area northeast of Athabasca, and the Amber Valley area, 16 km east of Athabasca, finding 29 and 18 species in flower, respectively, in these two areas. Dave Ealey and Leland Ferguson paid a second visit to Hanmore Lake, north of Smoky Lake, recording 28 (25) species in flower. Derek Johnson travelled to Bouchard Lake, 8 km northeast of Clyde, encountering 23 species in flower. The total number of species for the region was 68.

19. Grande Prairie: The annual report submitted by Gavin and Ellen Craig from their farm northeast of Wembley included 61 (67) species in flower this year. The reported occurrence of *Senecio canus* (Silvery Groundsel) in the Kleskun Hill Natural Area, well out of range according to Moss (1983), actually turned out to be *S. streptanthifolius* (Northern Ragwort) on submission of a specimen.

20. Fort McMurray: Over the past several years this area has had continued good support on the May Count. With a bit of an earlier spring, it was therefore somewhat disappointing that the 11 participants only managed to find 78 (92) species in flower. Marion Horrocks (compiler), Bill Bloomfield, Pat Connolly, Angela DeSilva, Fred Korbut, Helen Pachulko, Maria and Sarah Vyboh, Debbie Skaar, Shirley Stewart, and Jim Walbridge were the observers.

The 1993 count will be held on the weekend of May 29-30.

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FAN's May Species Count is held on the last weekend in May. This year May 29-30.

Send your May Species Count for Plants in Flower data to:

Derek Johnson
Northern Forestry Centre,
5420 - 122 Street, AB
T6H 3S5.

The deadline for FAN project reports are July 15th.

Bear-grass *Xerophyllum tenax* Photo by Julie Hrapko

1992 MAY SPECIES COUNT: PLANTS IN FLOWER

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
JUNCAGINACEAE (Arrow-grass Family)																					
Triglochin maritima	Seaside Arrow-grass				x																x
GRAMINEAE (Grass Family)																					
Alopecurus carolinianus	Carolina Foxtail				x																
A. occidentalis	Alpine Foxtail				x																
A. pratensis	Meadow Foxtail				x												x				
Bromus tectorum	Downy Chess				x																
Catabrosa aquatica	Brook Grass				x																
Dactylis glomerata	Orchard Grass				x																
Deschampsia cespitosa	Tufted Hair Grass				x																
Elymus junceus	Russian Wild Rye						x														
Festuca idahoensis	Idaho Fescue				x																
F. rubra	Red Fescue	x																			
F. saximontana	Sheep Fescue					x				x											
F. scabrella	Northern Rough Fescue	x		x	x			x													
Hierochloe odorata	Sweet Grass				x				x		x	x	x	x		x	x	x			
Koeleria macrantha	June Grass				x	x		x													
Oryzopsis asperifolia	White-grained Mountain Rice Grass								x									x			
O. pungens	Northern Rice Grass																		x		
Poa annua	Annual Bluegrass	x														x		x			
P. pratensis	Kentucky Bluegrass				x	x				x											
P. sandbergii	Sandberg's Bluegrass	x			x	x															
CYPERACEAE (Sedge Family)																					
Carex aenea	Silvery-flowered Sedge								x							x	x				
C. aquatilis	Water Sedge				x	x			x		x	x		x		x	x	x			
C. atherodes	Awned Sedge															x					
C. athrostachya	Long-bracted Sedge				x																
C. aurea	Golden Sedge										x		x			x			x		
C. brunnescens	Brownish Sedge															x	x				
C. capillaris	Hair-like Sedge															x	x	x			
C. curta	Short Sedge																x	x			
C. deweyana	Dewey's Sedge															x	x	x			
C. diandra	Two-stamened Sedge															x		x	x		
C. disperma	Two-seeded Sedge															x		x			
C. eburnea	Bristle-leaved Sedge															x					
C. gynocrates	Northern Bog Sedge											x				x	x		x		
C. interior	Inland Sedge															x					
C. lanuginosa	Woolly Sedge				x	x			x		x					x					
C. lasiocarpa	Hairy-fruited Sedge															x					
C. limosa	Mud Sedge															x					
C. livida	Livid Sedge															x			x		
C. microptera	Thick-spike Sedge								x												
C. norvegica	Norway Sedge																x	x			
C. praegracilis	Graceful Sedge		x		x				x							x					
C. prairea	Prairie Sedge															x	x		x		
C. richardsonii	Richardson's Sedge																x		x		
C. rostrata	Beaked Sedge								x			x					x	x			
C. sartwellii	Sartwell's Sedge				x											x	x	x			
C. scirpoidea	Rush-like Sedge				x							x									
C. siccata	Hay Sedge															x	x		x		x
C. sprengelii	Sprengel's Sedge															x					
C. vaginata	Sheathed Sedge															x		x			
C. viridula	Green Sedge															x					
C. xerantica	White-scaled Sedge				x				x												
Eleocharis palustris	Creeping Spike Rush				x	x			x	x						x					
E. quinqueflora	Few-flowered Spike Rush															x					
Eriophorum sp.	Cotton Grass																			x	x
E. polystachion	Tall Cotton Grass															x					x
E. viridi-carinatum	Thin-leaved Cotton Grass															x					
Scirpus cespitosus	Tufted Bulrush															x			x		
S. microcarpus	Small-fruited Bulrush					x												x			

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
S. pumilus	Dwarf Bulrush																	x			
S. pungens	Three-square Bulrush					x															
S. validus	Common Great Bulrush			x																	
ARACEAE (Arum Family)																					
Calla palustris	Water Calla																	x		x	
JUNCACEAE (Rush Family)																					
Juncus balticus	Baltic Rush				x	x															
Luzula multiflora	Field Wood Rush																x				
LILIACEAE (Lily Family)																					
Allium textile	Prairie Onion	x		x		x	x		x	x	x										
Camassia quamash	Blue Camas	x		x	x																
Disporum hookeri	Oregon Fairybells	x																			
D. trachycarpum	Fairybells	x	x		x			x	x		x	x	x	x	x	x	x	x		x	x
Erythronium grandiflorum	Glacier Lily	x	x										x								
Maianthemum canadense	Wild Lily-of-the-Valley															x				x	
Smilacina racemosa	False Solomon's-seal	x	x		x		x	x				x			x	x					
S. stellata	Star-flowered Solomon's-seal	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
S. trifolia	Three-leaved Solomon's-seal															x	x	x	x		
Zigadenus venenosus	Death Camas	x	x	x	x				x												
IRIDACEAE (Iris Family)																					
Sisyrinchium montanum	Common Blue-eyed Grass	x	x	x	x		x		x		x	x	x	x	x	x				x	
ORCHIDACEAE (Orchid Family)																					
Calypso bulbosa	Venus-slipper		x										x								x
Corallorhiza striata	Striped Coralroot								x			x									
C. trifida	Early Coralroot								x		x	x	x			x	x	x			
Cypripedium acaule	Stemless Lady's-slipper																				x
C. calceolus	Yellow Lady's-slipper											x									
C. montanum	Mountain Lady's-slipper	x																			
Habenaria viridis	Long-bracted Orchid				x				x		x	x	x							x	
Orchis rotundifolia	Round-leaved Orchid																	x			
SALICACEAE (Willow Family)																					
Salix spp.	Willows												x								
S. bebbiana	Beaked Willow			x	x						x	x				x	x		x		
S. exigua	Sandbar Willow				x					x	x					x					
S. lucida	Shining Willow															x	x	x			x
S. maccalliana	Velvet-fruited Willow															x	x				
S. myrtillifolia	Myrtle-leaved Willow											x									
S. pedicellaris	Bog Willow																		x		
S. planifolia	Flat-leaved Willow																x				
S. pyrifolia	Balsam Willow																x				
BETULACEAE (Birch Family)																					
Alnus crispa	Green Alder		x																x		x
Betula glandulosa	Dwarf Birch																				x
B. occidentalis	River Birch											x									
URTICACEAE (Nettle Family)																					
Urtica dioica	Common Nettle	x																			
SANTALACEAE (Sandalwood Family)																					
Comandra umbellata	Bastard Toadflax	x	x		x	x	x	x	x	x	x	x	x	x		x			x	x	x
Geocaulon lividum	Northern Comandra												x			x	x	x	x		x
POLYGONACEAE (Buckwheat Family)																					
Eriogonum flavum	Yellow Umbrellaplant				x	x	x	x		x			x								
E. ovalifolium	Silverplant	x																			
E. umbellatum	Umbrellaplant	x	x																		
Polygonum arenastrum	Common Knotweed									x						x					
P. bistortoides	Western Bistort	x		x	x				x												
P. erectum	Striate Knotweed															x					

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Rumex acetosa	Green Sorrel				x																
R. triangulivalvis	Narrow-leaved Dock				x				x	x											
R. venosus	Sand Dock						x														
CHENOPODIACEAE (Goosefoot Family)																					
Atriplex nuttallii	Nuttall's Atriplex									x											
Chenopodium capitatum	Strawberry Blite																	x			
C. salinum	Oak-leaved Goosefoot									x											
Eurotia lanata	Winterfat					x															
Monolepis nuttalliana	Spear-leaved Goosefoot				x				x							x					
AMARANTHACEAE (Amaranth Family)																					
Amaranthus graecizans	Prostrate Amaranth									x											
PORTULACACEAE (Purslane Family)																					
Claytonia lanceolata	Western Spring Beauty		x						x				x								
CARYOPHYLLACEAE (Pink Family)																					
Arenaria congesta	Rocky-ground Sandwort								x	x											
Cerastium arvense	Field Chickweed	x	x	x	x	x	x	x	x	x	x	x	x			x			x	x	
C. nutans	Long-stalked Chickweed															x	x	x			
C. vulgatum	Mouse-eared Chickweed		x				x	x	x	x			x	x			x	x	x		x
Minuartia obtusiloba	Sandwort	x																			
M. rubella	Red-seeded Sandwort	x	x	x								x									
Moehringia lateriflora	Blunt-leaved Sandwort		x		x				x		x	x	x	x		x	x	x	x		x
Paronychia sessiliflora	Low Whitlowwort					x															
Sagina saginoides	Mountain Pearlwort		x																		
Silene menziesii	Menzie's Catchfly					x															
Stellaria calycantha	Northern Stitchwort								x								x	x			
S. crassifolia	Fleshy Stitchwort		x		x																
S. longifolia	Long-leaved Stitchwort								x							x	x		x		
S. longipes	Long-stalked Stitchwort				x				x		x	x	x			x					
S. media	Common Chickweed												x			x		x			
RANUNCULACEAE (Crowfoot Family)																					
Actaea rubra	Red Baneberry	x	x					x	x		x	x	x	x	x	x	x	x	x	x	x
Anemone canadensis	Canada Anemone										x										
A. multifida	Cut-leaved Anemone	x	x	x	x	x	x	x	x		x	x	x	x					x		x
A. parviflora	Small Wood Anemone											x	x								
A. patens	Crocus Anemone	x	x		x				x		x	x	x						x	x	x
A. richardsonii	Yellow Anemone												x								
Aquilegia brevistyla	Small-flowered Columbine										x	x			x	x		x	x		x
A. flavescens	Yellow Columbine	x																			
Caltha natans	Floating Marsh Marigold																	x			
C. palustris	Marsh Marigold														x	x	x	x	x		x
Clematis occidentalis	Purple Virgin's-bower	x	x				x		x		x	x	x	x	x	x		x			
Coptis trifolia	Goldthread																				x
Delphinium bicolor	Low Larkspur	x	x	x	x				x												
Myosurus minimus	Least Mousetail				x																
Ranunculus abortivus	Smooth-leaved Buttercup								x		x					x	x	x	x		x
R. acris	Tall Buttercup	x							x			x	x				x				
R. cardiophyllus	Heart-leaved Buttercup	x		x	x				x		x	x								x	
R. circinatus	White Watercrowfoot						x														
R. cymbalaria	Seaside Buttercup				x		x		x		x	x				x					
R. eschscholtzii	Mountain Buttercup												x								
R. glaberrimus	Early Buttercup											x									
R. gmelinii	Small Yellow Watercrowfoot				x						x					x	x	x	x		
R. inamoenus	Graceful Buttercup		x																		
R. macounii	Macoun's Buttercup				x											x					
R. rhomboideus	Prairie Buttercup						x		x		x	x	x	x		x					
R. sceleratus	Celery-leaved Buttercup				x				x		x					x	x				
Thalictrum occidentale	Western Meadow Rue		x																		
T. venulosum	Veiny Meadow-rue	x		x	x			x	x		x	x	x	x	x	x	x	x	x	x	x
Trollius albiflorus	Globeflower	x																			
BERBERIDACEAE (Barberry Family)																					

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Berberis repens	Creeping Mahonia	x	x																		
FUMARIACEAE (Fumitory Family)																					
Corydalis aurea	Golden Corydalis										x		x	x		x	x	x		x	x
CRUCIFERAE (Mustard Family)																					
Alyssum alyssoides	Small Alyssum		x		x																
A. desertorum	Yellow Alyssum	x								x											
Arabis divaricarpa	Purple Rock Cress	x	x	x	x				x										x		
A. drummondii	Drummond's Rock Cress											x									
A. glabra	Tower Mustard				x				x												
A. hirsuta	Hirsute Rock Cress								x	x							x				x
A. holboellii	Reflexed Rock Cress		x		x	x					x	x	x								
A. lyrata	Lyre-leaved Rock Cress																				x
A. nuttallii	Nuttall's Rock Cress	x	x	x	x					x											
Barbarea orthoceras	American Winter Cress								x									x			
Brassica kaber	Wild Mustard				x		x	x			x			x		x					
Braya humilis	Leafy Braya										x										
Camelina microcarpa	Small-seeded False Flax				x																
Capsella bursa-pastoris	Shepherd's-purse			x	x		x		x		x	x		x		x		x	x	x	x
Cardamine pensylvanica	Bitter Cress															x	x	x		x	
Cardaria draba	Heart-podded Hoary Cress						x														
C. pubescens	Globe-podded Hoary Cress				x			x													
Conringia orientalis	Hare's-ear Mustard				x																
Descurainia pinnata	Short-fruited Tansy Mustard	x			x						x	x									
D. richardsonii	Grey Tansy Mustard											x									
D. sophia	Flixweed	x		x	x	x	x	x	x	x	x					x					
Draba aurea	Golden Draba		x									x									
D. cana	White Draba	x	x								x	x	x								
D. lonchocarpa	Draba											x									
D. nemorosa	Annual Draba			x	x							x	x			x			x		
D. oligosperma	Few-seeded Draba		x										x								
Erysimum asperum	Western Wallflower									x											
E. cheiranthoides	Wormseed Mustard			x	x	x															
E. inconspicuum	Small-flowered Prairie Rocket	x		x	x	x	x	x	x	x	x	x	x								
Hesperis matronalis	Dame's Rocket				x					x											
Lepidium densiflorum	Common Peppergrass	x			x	x		x		x						x		x			
L. ramosissimum	Branched Peppergrass							x													
Lesquerella alpina	Spatulate Bladderpod				x	x															
L. arenosa	Sand Bladderpod			x	x	x					x										
Nasturtium officinale	Water Cress				x								x								
Physaria didymocarpa	Twin Bladderpod	x					x	x				x	x								
Rorippa palustris	Marsh Yellow Cress															x	x	x			
Sisymbrium altissimum	Tumbling Mustard				x	x															
S. loeselii	Tall Hedge Mustard							x		x	x										
Thlaspi arvense	Stinkweed	x		x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x
CRASSULACEAE (Orpine Family)																					
Sedum lanceolatum	Lance-leaved Stonecrop	x																		x?	
Tolmachevia integrifolia	Rose-root											x									
SAXIFRAGACEAE (Saxifrage Family)																					
Chrysosplenium iowense	Golden Saxifrage														x	x	x	x			x
C. tetrandrum	Green Saxifrage															x					
Heuchera parvifolia	Small-leaved Alumroot	x																			
Mitella nuda	Bishop's-cap								x						x	x	x	x	x		
M. pentandra	Mitrewort		x																		
M. trifida	Mitrewort	x																			
Saxifraga bronchialis	Spotted Saxifrage											x									
S. occidentalis	Rhomboid-leaved Saxifrage								x												
S. oppositifolia	Purple Saxifrage											x									
GROSSULARIACEAE (Gooseberry Family)																					
R. americanum	Wild Black Currant															x		x			x
R. aureum	Golden Currant				x	x					x										
R. glandulosum	Skunkberry															x	x	x			x

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
R. hirtellum	Northern Gooseberry															x	x	x			
R. hudsonianum	Northern Black Currant								x					x		x	x	x	x		x
R. inerme	Mountain Gooseberry		x		x																
R. lacustre	Swamp Gooseberry	x	x						x			x	x			x	x				x
R. oxyacanthoides	Northern Gooseberry				x				x		x	x	x	x		x	x	x		x	x
R. triste	Swamp Red Currant				x				x					x		x	x	x	x		x
ROSACEAE (Rose Family)																					
Amelanchier alnifolia	Saskatoon	x	x		x			x	x	x	x	x	x	x		x	x	x	x	x	x
Chamaerhodos erecta	Chamaerhodos				x	x		x			x	x									
Crataegus rotundifolia	Round-leaved Hawthorn				x				x							x		x			
Dryas drummondii	Yellow Mountain-avens	x										x	x								
D. octopetala	White Mountain-avens											x									
Fragaria vesca	American Wild Strawberry															x		x			x
F. virginiana	Smooth Wild Strawberry	x	x		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
Geum aleppicum	Yellow Avens				x											x				x	
G. rivale	Purple Avens																		x		
G. triflorum	Three-flowered Avens	x		x	x		x	x	x	x	x	x	x	x						x	
Potentilla anserina	Silverweed	x		x	x	x	x		x	x	x	x	x			x					x
P. arguta	White Cinquefoil				x																
P. concinna	Early Cinquefoil	x		x	x		x		x		x		x								
P. fruticosa	Shrubby Cinquefoil	x	x	x	x		x	x	x	x	x	x	x								
P. glandulosa	Sticky Cinquefoil	x	x																		
P. gracilis	Graceful Cinquefoil	x	x	x	x				x												
P. hippiana	Woolly Cinquefoil	x			x																
P. hookeriana	Hooker's Cinquefoil											x									
P. nivea	Snow Cinquefoil											x	x								
P. norvegica	Rough Cinquefoil	x			x							x	x					x		x	
Prunus pensylvanica	Pin Cherry		x						x			x		x		x	x		x	x	x
P. virginiana	Black-fruited Choke Cherry	x	x		x		x	x	x		x	x	x	x	x	x	x	x	x	x	x
Rosa sp.	Wild Rose										x				x					x	
R. acicularis	Prickly Rose	x												x		x					
R. woodsii	Wood's Rose					x	x			x											
Rubus arcticus	Stemless Raspberry											x	x		x	x	x	x	x		x
R. chamaemorus	Cloudberry																x				x
R. idaeus	Wild Red Raspberry											x	x	x		x			x		
R. pubescens	Dewberry								x		x			x	x	x	x	x	x		x
LEGUMINOSAE (Pea Family)																					
Astragalus aboriginum	Indian Milk-vetch	x			x				x		x	x	x								
A. alpinus	Alpine Milk-vetch		x																		
A. bisulcatus	Two-grooved Milk-vetch				x	x	x			x										x	
A. crassicarpus	Ground Plum			x	x				x		x										
A. dasyglottis	Purple Milk-vetch	x		x	x		x		x	x	x	x		x		x					
A. eucosmus	Milk-vetch											x				x					
A. flexuosus	Slender Milk-vetch				x																
A. gilviflorus	Cushion Milk-vetch								x												
A. kentrophyta	Prickly Milk-vetch					x															
A. missouriensis	Missouri Milk-vetch						x														
A. pectinatus	Narrow-leaved Milk-vetch	x?			x	x	x		x	x	x										
A. striatus	Ascending Purple Milk-vetch					x								x						x	
A. tenellus	Loose-flowered Milk-vetch	x								x										x	
A. vexilliflexus	Few-flowered Milk-vetch		x	x	x																
Caragana arborescens	Common Caragana				x		x				x			x		x		x	x	x	
Hedysarum boreale	Northern Sweet Vetch					x					x	x	x								
H. sulphurescens	Yellow Sweet Vetch	x	x		x							x									
Lathyrus ochroleucus	Cream-colored Vetchling	x	x		x				x		x	x	x	x	x	x	x	x	x		x
Lupinus argenteus	Silvery Lupine		x		x		x	x	x												
L. lepidus	Alpine Lupine			x	x					x											
L. pusillus	Annual Lupine									x											
L. sericeus	Flexile Lupine	x			x						x										
Medicago lupulina	Black Medick	x	x	x	x		x		x			x	x			x					
M. sativa	Alfalfa						x			x											
Melilotus alba	White Sweet Clover						x														
M. officinalis	Yellow Sweet Clover	x					x			x											
Onobrychis viciifolia	Sainfoin																			x	

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Oxytropis sericea	Early Yellow Locoweed	x	x	x	x	x		x	x	x	x	x	x	x							
O. splendens	Showy Locoweed				x						x										
O. viscida	Viscid Locoweed			x	x							x	x								
Thermopsis rhombifolia	Golden-bean				x	x	x	x	x	x	x			x							
Trifolium hybridum	Alsike Clover	x			x									x		x					
T. repens	White Clover	x	x				x		x				x	x		x		x			x
Vicia americana	American Vetch	x			x	x	x		x	x	x	x	x	x	x	x				x	x
GERANIACEAE (Geranium Family)																					
Geranium bicknellii	Bicknell's Geranium		x						x										x		
G. richardsonii	Wild White Geranium	x													x						
G. viscosissimum	Sticky Purple Geranium	x			x			x	x		x										
LINACEAE (Flax Family)																					
Linum lewisii	Lewis' Wild Flax	x			x	x	x	x	x	x	x	x	x	x						x	
L. rigidum	Yellow Flax					x															
POLYGALACEAE (Milkwort Family)																					
Polygala paucifolia	Fringed Milkwort																				x
P. senega	Seneca Snakeroot													x							
EUPHORBIACEAE (Spurge Family)																					
Euphorbia esula	Leafy Spurge				x		x			x						x					
CELASTRACEAE (Bittersweet Family)																					
Pachistima myrsinites	Mountain Lover		x																		
RHAMNACEAE (Buckthorn Family)																					
Rhamnus alnifolia	Alder-leaved Buckthorn																				x
MALVACEAE (Mallow Family)																					
Sphaeralcea coccinea	Scarlet Mallow					x	x			x											
VIOLACEAE (Violet Family)																					
Viola adunca	Early Blue Violet	x	x	x	x				x		x	x	x	x		x	x		x	x	x
V. arvensis	European Field Pansy			x																	
V. canadensis	Western Canada Violet	x	x		x			x	x		x	x	x	x	x	x	x	x	x	x	x
V. glabella	Yellow Wood Violet	x	x																		
V. macloskeyi	Macloskey's Violet	x	x																		
V. nephrophylla	Bog Violet				x			x	x		x	x		x		x		x			x
V. nuttallii	Nuttall's Yellow Violet				x				x												
V. orbiculata	Round-leaved Wood Violet	x	x										x								
V. palustris	Marsh Violet															x	x	x			
V. pedatifida	Crowfoot Violet													x							
V. renifolia	Kidney-leaved Violet								x				x			x		x	x		x
V. selkirkii	Great-spurred Violet															x					
CACTACEAE (Cactus Family)																					
Coryphantha vivipara	Cushion Cactus						x														
ELAEAGNACEAE (Oleaster Family)																					
Elaeagnus commutata	Wolf Willow	x			x	x	x	x	x	x	x	x	x	x		x		x		x	x
Shepherdia canadensis	Canada Buffaloberry												x								x
ONAGRACEAE (Evening Primrose Family)																					
Gaura coccinea	Scarlet Butterflyweed					x	x			x											
Oenothera caespitosa	Butte Primrose				x		x														
ARALIACEAE (Ginseng Family)																					
Aralia nudicaulis	Wild Sarsaparilla													x		x	x	x	x		x
UMBELLIFERAE (Carrot Family)																					
Angelica dawsonii	Yellow Angelica	x	x																		
Bupleurum americanum	Thorough-wax	x																			
Heracleum lanatum	Cow Parsnip	x			x																
Lomatium cous	Biscuit-root								x												

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L. dissectum	Mountain Wild Parsnip	x			x								x								
L. foeniculaceum	Hairy-fruited Parsley							x												x	
L. macrocarpum	Long-fruited Parsley	x		x	x				x												
L. triternatum	Western Wild Parsley	x	x	x	x																
Musineon divaricatum	Leafy Musineon			x	x	x		x	x		x										
Osmorhiza chilensis	Blunt-fruited Sweet Cicely								x												
O. depauperata	Spreading Sweet Cicely						x		x			x			x	x		x			
O. longistylis	Smooth Sweet Cicely															x					
O. occidentalis	Western Sweet Cicely	x	x																		
Zizia aptera	Heart-leaved Alexanders			x	x			x	x		x	x	x				x			x	
CORNACEAE (Dogwood Family)																					
Cornus canadensis	Bunchberry	x													x	x		x			
C. stolonifera	Red-osier Dogwood	x			x		x		x	x	x	x		x		x			x	x	x
PYROLACEAE (Wintergreen Family)																					
Pyrola asarifolia	Common Pink Wintergreen														x?						
ERICACEAE (Heath Family)																					
Andromeda polifolia	Bog Rosemary															x			x		x
Arctostaphylos rubra	Alpine Bearberry											x	x								
A. uva-ursi	Common Bearberry								x		x	x	x				x		x		x
Chamaedaphne calyculata	Leatherleaf																		x		x
Kalmia polifolia	Pale Laurel																				x
Ledum groenlandicum	Common Labrador Tea															x	x	x	x	x	
Oxycoccus microcarpus	Small Bog Cranberry															x	x				
O. quadripetalus	Small Bog Cranberry															x					
Vaccinium caespitosum	Dwarf Bilberry		x						x										x		
V. myrtilloides	Blueberry															x	x		x	x	x
V. scoparium	Grouseberry		x																		
V. vitis-idaea	Bog Cranberry															x	x	x	x		
PRIMULACEAE (Primrose Family)																					
Androsace chamaejasme	Pygmy Shieldwort	x									x	x	x								
A. septentrionalis	Pygmyflower	x	x	x	x				x	x	x	x	x	x		x	x		x	x	x
Dodecatheon conjugens	Mountain Shootingstar	x	x	x	x			x	x		x	x	x								
D. pulchellum	Saline Shootingstar				x		x				x	x	x	x		x					x
Glaux maritima	Sea Milkwort						x														
Primula incana	Mealy Primrose								x							x					x
P. mistassinica	Dwarf Primrose												x								
Trientalis borealis	Northern Starflower																		x		x
MENYANTHACEAE (Buck-bean Family)																					
Menyanthes trifoliata	Buck-bean															x					x
POLEMONIACEAE (Phlox Family)																					
Collomia linearis	Narrow-leaved Collomia				x																
Phlox alyssifolia	Blue Phlox			x	x																
P. hoodii	Moss Phlox			x	x				x	x	x										
Polemonium pulcherrimum	Showy Jacob's-ladder	x	x									x	x								
HYDROPHYLLACEAE (Waterleaf Family)																					
Phacelia hastata	Silver-leaved Scorpionweed		x																		
P. sericea	Silky Scorpionweed	x	x										x								
BORAGINACEAE (Borage Family)																					
Cryptantha macounii	Macoun's Cryptanthe			x	x			x	x	x											
C. nubigena	Clustered Cryptanthe	x				x	x														
Cynoglossum officinale	Hound's-tongue	x			x		x														
Hackelia floribunda	Large-flowered Stickseed			x	x	x		x													
H. jessicae	Jessica's Stickseed	x	x																		
Lappula occidentalis	Western Bluebur		x		x	x	x			x	x										
Lithospermum incisum	Narrow-leaved Puccoon	x				x				x	x		x								
L. ruderale	Woolly Gromwell	x	x	x	x			x	x		x	x	x								
Mertensia paniculata	Tall Lungwort										x	x		x	x	x	x	x	x	x	x
Myosotis alpestris	Alpine Forget-me-not	x						x?					x								

1992 May Species Count for Birds and Mammals

Don Stiles

This is my first attempt at compiling the May Species Count. I acknowledge the help of Ross Dickson, the previous compiler, particularly in comparing these results to previous counts. There were 17 counts, 239 observers, reporting 252 species with 93119 birds. This compares to 16 counts, 302 observers, with 258 species and 90196 birds in 1991.

New counts were reported from Suffield, Coyote Lake, Glenevis, Elk Island National Park, and Lac la Biche. Four counts were dropped, including Edmonton, where some of their members put their efforts into a Baillie Birdathon, counting species at Beaverhill Lake.

Methodology: The May Species count is held on the last weekend in May. Compilers collect data from an 80 km radius of their base, although this is occasionally stretched somewhat. Some counts have been published earlier in greater detail in local natural history bulletins, including: Lethbridge, which also publishes for Waterton, Cardston, and Claresholm as well as Medicine Hat, Calgary, Red Deer and Beaverhill Lake. Counts varied in the number of parties out - from 23 at Calgary, 11 at Red Deer, 10 at Beaverhill Lake, down to 1 at several of the smaller counts with 2 or 3 observers.

Some deviances from the dates of May 30 and 31 occurred this year. Calgary thought the date was the first weekend after the long weekend in May. This fits most years but not 1992. Calgary proceeded with their May 23 and 24 dates as they already had their advertising in place when they learned of the correct dates. Waterton conducted their count on June 5 and 6 to allow people from Lethbridge to participate. The Beaverhill Lake count includes one banding team's efforts from May 20 to June 1. Birds not banded May 30 and 31 for this team were designated count week species.

Results: Compared to 1991, number of counts were up one, number of observers and species were down, although number of birds were up. Groups with large numbers of birds such as waterfowl, gulls, swallows and blackbirds were checked to look for trends, but none were found. Some of these species were up in numbers from 1991 and some were down.

Increases from 1991 in the number of species seen increased on most of the counts, particularly in the smaller centres, even though the total number of species was down. The most dramatic increase was at Banff, up 44 species due to a number of keen new observers. Double digit increases were also noted at Bindloss, +16, Yamnuska, +13, and Grande Prairie, +15. Cardston has set new highs since 1987 with species numbers each year of 65,71,77, 89 and 102. Will this trend continue?

Ross Dickson pointed out that there were no species reported on the 1992 count which hadn't been seen in previous counts, which have been compiled since 1976 with a cumulative total species of 299. This is in spite of the variability in the count dates and new counts mentioned above. Ross has discussed potential species which may be expected in his May Species Count -1990 article (Alberta Naturalist Vol. 21, No. 1, Spring 1991, p-40-42). He categorizes these into several groups including: 1) known breeders, but local, often in areas not (usually) censused, and 2) well known wanderers. In 1) above, species still not seen are Black Swift, Sage Thrasher, and Clark's Grebe (although this was seen in 1992 on count week). To this list might be added birds from the new Breeding Bird Atlas of Alberta which are local or occasional breeders, such as Willow Ptarmigan and Eastern Bluebird. Table 2 on page 42 of the above article gives a list of species not seen on the May count of 1990, but seen on at least one count from 1976 to 1989. Half of these were also not seen in 1991 or 1992 and could be considered rare sightings. Most new species discovered on the May count will have to be vagrants, Ross suggests.

Interesting Notes and Rare Sightings from the Compilers:

Lethbridge: Two Eurasian Wigeon were seen for the first time on the May count from two separate locations. This species is becoming more regularly seen in southern Alberta. White-faced Ibis and Northern Mockingbird eluded Lethbridge on count days in both 1991 and 1992, but both were seen in count week on both years. Claresholm also saw a Northern Mockingbird on count week this year. Lethbridge, Waterton, Cardston and Claresholm all had five or more species seen for the first time.

Medicine Hat: A flock of 18 Black-necked Stilts was seen along the South Saskatchewan River. A Blue Jay was seen in Medicine Hat for the first time on the May count. Although nesting was watched for, neither species turned out to be a proven nester in 1992. Blue Jays are known to nest as near as Brooks.

Calgary: Interesting new species for Calgary were a Snow Goose at both Irricana Reservoir and Namaka Lake, a Piping Plover at Namaka Lake, and a Brewer's Sparrow at a back yard in Ogden.

Glenevis: This count picked up two Barred Owls, which were not found on any other count.
Beaverhill Lake: 17 species reported this year but not in 1991, and 23 species reported in 1991 but not in 1992 indicates the variability in the species passing through here. Part of the reason for this would be the later date of May 30 and 31 in 1992 as compared to May 25 and 26 in 1991. This late date caused six species of shorebirds seen in 1991 to be missed in 1992. Early morning efforts with a tape recorder playing calls picked up Virginia and Yellow Rails this year. Nests were found for Northern Harrier, Cooper's Hawk, and Long-eared Owl.

Grande Prairie: A Bobolink was a rare sighting, and an Osprey only an occasional sighting for the area. three Mew Gulls were also rare for this count, and for Alberta.

The following are the participants, as well as areas covered, team hours, distance and weather, if given.

Lethbridge: May 30-31. Compiler: Teresa Dolman, 37 Carleton Rd. W. Lethbridge, AB. T1X 3X4.
Participants: Dale & Paul Baumback, Lloyd & Bruce Bennett, Linda Cerney, Teresa & Doug Dolman, Vitek & Andrew Gierulski, Connie Goodall, Victor Hafichuk, Betty Haig, Bob Hall, Alice Harper, Harcourt & Eileen Hobbs, Harold & Olga Hughes, Mike Klassen, Jennifer & Lyn Mather, Jeannette Maynard, Lois McKillop, Laure Neish, Sheila Petherbridge, Linda Redmond, Doris Rhodes, Hazel & Gordon Ross, Katherine & Frank Russell, Liz Savoy, Arvid & Francis Schultz, Bill Sharp, Eddy St. George, Hazel West, Joyce, Jessica, & Paul Wilkinson.
Areas covered: Stirling Lake, Tyrrell Lake, Picture Butte, Travers Reservoir, Little Bow Reservoir and Provincial Park, South end of Lake McGregor, Lomond & area, St. Mary & Oldman River junction, Six-mile & Sugarbowl Coulees, Mt. View Cemetery, Alexander Wilderness Park, Keho Lake, Monarch area, Jail Pond, NE Reservoir, Coaldale, Prouty Lake, St. Mary River & Pothole Creek area, Magrath Park, Russell Ranch, Park Lake & Taber Provincial Parks, Pavan Park, Lethbridge Nature Reserve, Taber, Fincastle & Horsefly Reservoirs, Lost Lake, Taber, Monarch, Ft. Macleod, McNally Road to Roxburn.
Team Hours: By vehicle; 49.5, By foot; 73.5.
Team Distance: By veh.; 1134 km, By ft.; 86.5 km.
Weather: May 30; 6-16C, Wind NW 10-46, Trace precip. May 31; 8-22C, Wind E 0-32, dry.

Waterton: June 4 & 5. Compiler: Teresa Dolman.
Participants: Dale & Paul Baumback, Teresa & Doug Dolman, Witek Gierulski, Glen Goerzen, Ray Gossen, Graeme, Edith and Lloyd Greenlee, Betty Haig, Sheila Petherbridge, Gordon & Hazel Ross, Shirley Sillito, Doug Walker.
Areas covered: Road from town to park entrance, Belly River road, buffalo paddocks, Vimy Trail, Bertha Lake tail, Red Rock road to Coppermine Creek, Crandell Lake trail, Rowe Lake trail, Lineham Lake trail, Sofa trail.
Team Hours: By vehicle; 7, By foot; 32.5.
Team Distance: By veh.; 58 km, By foot; 45 km.
Weather: June 4; 3-16C, Calm, 1.4 mm precip. June 5; 5-17C, Calm, 8.7 mm precip.

Cardston: May 30 & 31. Compiler: Shirley Sillito, Box 1102, Cardston, AB T0K 0K0.
Participants: Fay Clawson, Rita Scotter, George & Etta Scotter, Shirley Sillito, Barbara & Lynn Sommerfeldt.
Areas covered: Cardston, Woolford Park, Jefferson, Glenwood, Hillspring, Police Outpost Provincial Park, Whiskey Gap.
Team Hours: By vehicle; 18. By foot; 30.
Team Distance: By veh.; 319 km, By foot; 15 km.
Weather: May 30; 5-15C, Wind 5-25, trace precip. May 31; 10-30C, Wind W 5, dry.

Claresholm: May 30 & 31. Compiler: Grace Norgard, Box 10, Claresholm, AB T0L 0T0.
Participants: Jason & Ruth Atwell, Hazel Hudson, Mike Klassen, Grace Norgard, Liz Savoy, Al Williams.
Areas Covered: 40 km radius of Claresholm.
Team Hours: By vehicle; 40.5, By foot; 11
Team distance: By veh.; 656 km., By foot; 18 km.
Weather: May 30; 10C, Wind NW 10-50, trace precip. May 31; 22C, Wind SW 5, dry.

Medicine Hat: May 31. Compiler: Dennis Baresco, 580-1st St. SE, Medicine Hat, AB T1A 8E6.
Participants: Dennis Baresco, Barb Chisholm, Eileen Cowtan, Bob & Corlaine Gardner, Rick Brandstaetter, Phil Horch, Lex Karne, Carolyn Kury, Garry Newton, Mark & Kendra Oxamitny, Mark & Dan Schiebelbein, Bill & Ruth Tidy, Ben & Michael Velner.
Team Hours: By vehicle; 18, By foot; 44.
Team Distance: By veh.; 383 km, By foot; 64 km.
Weather: Cloudy and cool in A.M. (8 to 10C), sunny and warm in P.M. (20C), no wind or precip.

Suffield: June 1. Compiler: Nick Worthington, 5 Porton Place, Ralston, AB T0J 2N0.
Participants: Nick & Sylvia Worthington.
Areas Covered: Centre of count 500 m west of Ralston.
Team Hours: 7.
Team Distance: By vehicle; 6 km, By foot; 6 km.
Weather: Good (Sunny, warm, light wind).

Bindloss: May 23. Compiler: Michael O'Shea, Gen. Del., Bindloss T0J 0H0.
Participants: Cresten Andersen, Derek Barnes, Michael O'Shea.
Team Hours: 8.5.
Team Distance: By vehicle; 63 km, By foot; 3 km.
Weather: 0 to 5C, Cloud cover, light drizzle in P.M.

Calgary: May 23, 24. Compiler: Rodger Dunn, 8 Varbow Place NW, Calgary, AB T3A 0B6.
Participants: John Bargman, Brenda Boyechko, Karen Christensen, Eileen Dann, Rodger & Jean Dunn, Dena Farquharson, Kathleen Good, David Gravells, Horst Grothman, Ian & Nora Halladay, Carol Hinatsu, Vivian Hindbo, Andrew Holder, Clay Hunt, Linda Joehnck, Steve Kassai, Ruth MacRae, Janine Martin, Sheilagh McDonagh, Jan & Malcolm McDonald, Bill McKitterick, Ken Oakes, Ruth Obromniak, Jane Owens, Tracy Patterson, Jamey Podlubny, Jim Posey, Kay & Mike Power, Ena Spalding, Milt & Elaine Spitzer, Don & Phil Stiles, Don Thurgarland, Howard Troughton, Suzanne Visser, Jim Washbrook, Bill Wilson.
Areas Covered: Irricana Sloughs, Bruce Lake, Bowmont Flats, Brown Lowery Natural Area, Bragg Creek, Springbank, Lowery Gardens, Edworthy Park, Big Hill Springs, Mallard Point and north, Eagle and Namaka Lakes, Paskapoo and Burnco Slopes, Glenbow Lake, McGregor Lake, Bow Valley Provincial Park, Lac des Arcs, Clay Hunt Ranch, Confederation Park, Queen's Park Cemetery, Beaverdam Flats, McElroy Slough, McKinnon Flats, South Glenmore, Weaselhead, Highway 24 Sloughs, Wyndham/Carseland Provincial Park, Dalemead Reservoir, Bow River SE of Calgary, Ogden Backyard, North Glenmore, Inglewood Bird Sanctuary.
Team Hours, distance and weather not given.

Banff-Canmore-Wind Ridge: May 31. Compiler: Mike McIvor, Box 114, Banff, AB T0L 0C0.
Participants: Gail & Bruce Bembridge, Heather Dempsey, Peter Duck, Halle Flygare, Joel Huge, Marjory Gibney, Myriam & Doug Leighton, Mike & Diane McIvor, Albert Mazzucchi, Mike Potter, Bob & Mary Smith, Keith Webb.
Team Hours, distance and weather not given.

Yamnuska: May 30. Compiler: Mike McIvor.
Participants: Deborah Hornsby, Myriam & Doug Leighton, Diane & Mike McIvor, Bob & Mary Smith.
Team Hours, distance and weather not given.

Red Deer: May 31. Compiler: Myrna Pearman, Box 127, Sylvan Lake, AB T0M 1Z0.
Participants: Mary Coughlin, Lloyd & Betty Cumming, Dorothy Dickson, Russ & Jill Down, Stewart & Eileen Ford, Phil & Pat Greenaway, Helen Harris, Dorothy Hazlett, Dell James, Gordon Johnson, Gery & Peggy Kadey, Ken, Linda, Laura & Michelle Larsen, Eileen & Art Lawrence, Doug & Dianne Lindblom, Murray McKay, Germaine Maga, Jane Ming, Sheryl Nixon, Myrna Pearman, Albert & Beth Peck, Tom Pierce, Bill & Cynthia Post, Joanne & Joan Susut, Roger & Molly Swan, Doug Taylor, Betty Teares, Kerry, Marjorie, & Rondo Wood.
Areas Covered: Benalto, Burnstick Lake (2 parties), Crestomere, Kneehill Valley, Lacombe, Pine Lake, Ponoka, Red Deer, Sylvan Lake, Trenville Park.

Team Hours: By vehicle; 22.5, By foot; 60.
Team Distance: By veh.; 306.5 km, By ft. 94.5 km.
Weather: Not given.

Coyote Lake Nature Sanctuary (65 km west of Leduc): May 30, 31. Compiler: Doris Hopkins, RR #1, Warburg, AB T0C 2T0.
Participants: Doris & Eric Hopkins, Fran Losie.
Areas Covered: 1/2 section on north shore of Coyote Lake.
Team Hours: 10.
Team Distance: 8 km.
Weather: May 30; 6-18C, Wind NW moderate, showers and cloud. May 31; 6-24C, Wind SW light, dry and sunny.

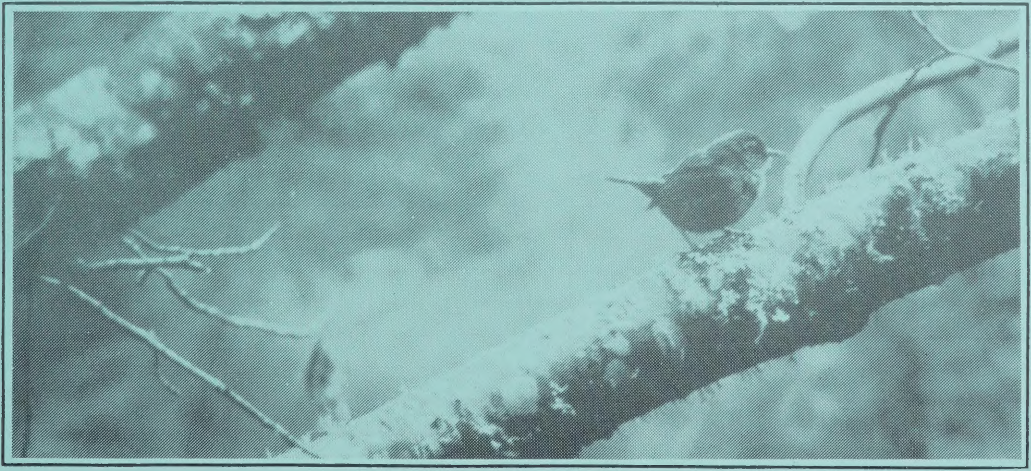
Glenevis: May 30. Compiler: Dave Cuthiell, 11403-59 Ave., Edmonton, AB, T6H 1G4.
Participants: Peter Achuff, Leslie Baker, Elizabeth Beaubien, Patsy Cotterill, Dave Cuthiell, Ewen Cuthiell, Carolyn Martin, Rayma Peterson.
Areas Covered: Vicinity of Glenevis.
Team Hours: 6.
Team Distance: By vehicle; 15 km, By foot; 2 km.
Weather: Not given.

Beaverhill Lake: May 30, 31, Banding May 20 to June 1 (1 party). Compiler: Roy Fairweather, RR #2, Tofield, AB T0B 4J0.
Participants: Pat Crossley, Dick Decker, Jason Duxbury, Roy Fairweather, Jim Faragini, Peter Haddock, Kevin Hento, Geoff & Michael Holroyd, Brian Hornby, Edgar T. & Jeanne Jones, Stefan Jungkind, Steve Lane, Jim Lange, Gerry Lunn, Gerry McKeating, Pat Nolan, Elson Olorenshaw, Petra Stubbs.
Areas Covered: Beaverhill Lake Natural Area and vicinity, Banding stations (2 parties), Canoing Lister Lake and south along Amisk Creek to Weir (north of Amisk Creek bridge).
Team Hours: By vehicle; 31, By foot; 67, By canoe; 4.
Team Distance: By veh.; 200 km, By foot 67 km, By canoe; 8 km.
Weather: May 30; 5-16C, Gusty winds, drizzle, overcast, cold. May 31; 8-21 C, Slight winds, no rain, mostly sunny, pleasant.

Elk Island National Park: May 30 & 31. Compiler: Bob Carroll, RR #2, Ft. Saskatchewan, AB. T8L 2N8.
Participants: Bob Carroll, Jack Park, Dave Pick.
Team Hours: 14.
Team Distance: By vehicle; 200 km, By foot; 4 km.
Weather: Not given.

Lac la Biche: May 31. Compiler: Dave Ealey, 3903-105 St., Edmonton, AB T6J 2K7.
Participants: Dave Ealey, Leland Ferguson.
Areas Covered: Highways in East Central Alberta (#45,55,63,831,663,868) with stops at Hanmore Lake area, Lac la Biche, Sir Winston Churchill Provincial Park, and Charron Lake.
Team Hours: By vehicle; 8.
Team distance: By vehicle; 528 km.
Weather: Not given.

Grande Prairie: May 30 & 31. Compiler: Ellen Craig, RR #1. Wembley, AB. T0H 3S0.
Participants: Gavin & Ellen Craig.
Areas Covered: Bear Lake and vicinity, Cutbank Lake, Saskatoon Lake and vicinity, Hermit Lake.
Team Hours: May 30; By vehicle; 2.5, By foot; 1.5. May 31; By veh.; 1.25, By foot; 2.5.
Team Distance: May 30; By vehicle; 39 km, By ft.; 2 km. May 31; By veh. 19 km, By ft.; 3.25 km.
Weather: May 30; 15C, Wind SW to E, sunny with a few clouds. May 31; 21C, Strong SW wind, overcast in A.M., sunny in p.m.



Winter Wren
Photo by Dan Farr

MAMMALS

Twenty five species of mammals were recorded on nine counts compared to 28 on seven counts in 1991.

Bison and Elk were noted from Elk Island National Park as in 1991.

Mammals not seen in 1992 were mainly the large mammals including: Bighorn Sheep, Gray Wolf, Grizzly Bear, and Black Bear (the latter three from tracks only). Also not seen in 1992 were Raccoon, Pine Marten, Groundhog, and Northern Flying Squirrel.

However, the 1992 count did pick up some species missed in 1991: Short-tailed Weasel (Lethbridge), Long-tailed Weasel (Red Deer), Golden-mantled Ground Squirrel (Waterton), and Meadow Vole (Lethbridge). Mice and voles are hard to spot when you're looking up for birds.

X = Present

LEGEND:

LETH	Lethbridge
WATE	Waterton
CARD	Cardston
CLAR	Claresholm
MEDH	Medicine Hat
SUFF	Suffield
BIND	Bindloss
CALG	Calgary
BANF	Banff/Canmore/WindRidge
YAMN	Yamnuska
REDD	Red Deer
COYL	Coyote Lake Nature Sanctuary
GLEN	Glenevis
BEAV	Beaverhill Lake
ELKI	Elk Island National Park
LACB	Lac La Biche
GRAN	Grande Prairie

1992 MAY SPECIES COUNT - MAMMALS

MAMMAL SPECIES	LETH	WATE	CARD	CLAR	BIND	REDD	BEAV	ELKI	GRAN
Bison								20	
Mule Deer	X	X	X	X	4	10			6
White-tailed Deer	X	X	X	X		2	1	5	
Pronghorn Antelope	X		X		11				
Moose						4			
Elk								20	
Coyote	X	X	X	X			2	3	2
Red Fox	X		X						
Striped Skunk	X		X	X					
American Badger		X		X					
Short-Tailed Weasel	X								
Long-Tailed Weasel						1			
Yellow-bellied Marmot	X								
Richardson's Ground Squirrel	X		X	X		50		150	
Columbian Ground Squirrel		X	X	X					
Golden-mantled Grd. Squirrel		X							
Red Squirrel		X		X		16		6	3
Least Chipmunk		X							
Meadow Vole	X								
Porcupine	X				2	2	1		
Beaver	X					7		1	4
Muskrat	X		X			5		2	
Snowshoe Hare						7		1	
Nuttall's Cottontail				X	1				
White-tailed Jackrabbit	X		X	X			1		

1992 MAY SPECIES COUNT - BIRDS

SPECIES	LETH	WATE	CARD	CLAR	MEDH	SUFF	BIND	CALG	BANF	YAMN	REDD	COYL	GLEN	BEAV	ELKI	LACB	GRAN
Common Loon	3		5					4	9	2	17	3			4	6	
Pied-billed Grebe	17				4	1	1	5		3	13	1		18	CW		6
Horned Grebe	5	1			2		1	16			267			11	4		1
Red-necked Grebe	7		36					34	3		390	10		9	50	38	6
Eared Grebe	369		22	166	24	2	19	496			182	4	1	203	1000		239
Western Grebe	31		5		45	1		52			17	1	12	4	15		
Clark's Grebe															CW		
Am. White Pelican	244		40		24			136						100	120		
Double-cr. Cormorant	172		4		5			99						48	60	280	
American Bittern	4		4					2				3		28	2		1
Great Blue Heron	17	2	4	7	47		1	20			56			1	3		
Black-cr. Night Heron	6				1			8						20	8		
White-faced Ibis	CW																
Tundra Swan								1									
Trumpeter Swan	CW			2										1	4		15
Gr. White-fronted Goose														3			
Snow Goose								2									
Canada Goose	892	2	763	389	588	42	81	1204	72	3	322	8	16	787	40		291
Wood Duck								10	2								
Green-winged Teal	37	2		21	5	6	4	136	11	6	8	2	2	69 +	12	10	3
Mallard	391	23	326	156	175	55 +	15	743	142	22	135	6	2	310	100	50	326
Northern Pintail	154		26	25	78	50 +	7	74			26		1	42	10	2	14
Blue-winged Teal	219	2	83	64	59	20 +	24	338	15	7	233		3	335 +	30	29	49
Cinnamon Teal	110	1	46	15	4	3		104	17	2	27		1	15	2		
Northern Shoveler	244		59	40	91	50 +	19	420			39		1	420 +	200	7	78
Gadwall	257		19	37	31	20 +	115	294			25		7	115 +	30	13	47
Eurasian Wigeon	2																
American Wigeon	126	6	28	2	25	50 +	9	88			6	2	3	50	20	39	94
Canvasback	84		24	2	26	9	2	53			54			71	10	1	44
Redhead	102		6	2	20	20	1	125			121			101	30		33
Ring-necked Duck	4	1	3	4	3			9	2	4	24	6		6	15	7	10
Greater Scaup								2			1						
Lesser Scaup	260		75	6	94	80 +	10	425	14		157	6	15	319	50	16	729
Harlequin Duck									18								
Surf Scoter									1								
White-winged Scoter	11		6					21			2		1	5	4	3	281
Common Goldeneye	3		4	6	10			61			80		12	14	25	20	5
Barrow's Goldeneye	2	13	2					3	21	2	48				32		22
Bufflehead	54		16	2	10			64	6	15	66	4	5	62	100	17	10
Hooded Merganser					2			3	1	2		4		CW			
Common Merganser	30	6			26			63	20		7						
Red-breasted Merganser									1						4		
Ruddy Duck	89		22	4	11	50 +	22	195			66		6	533	20		120
Osprey	1	1						5	5								1
Bald Eagle									4		2						3
Northern Harrier	23		26	15	11	3	3	29	1		3			41	1	2	3
Sharp-shinned Hawk								2			2			2	1		
Cooper's Hawk														1			

1992 MAY SPECIES COUNT - BIRDS

SPECIES	LETH	WATE	CARD	CLAR	MEDH	SUFF	BIND	CALC	BANF	YAMN	REDD	COYL	GLEN	BEAV	ELKI	LACB	GRAN
Northern Goshawk				1	1			5			2			2	CW		2
Broad-winged Hawk															2		
Swainson's Hawk	57	1	43	105	28	4	8	82			4			8	1		
Red-tailed Hawk	30	6	10	39	4			115	2	4	41	2		35	15	8	7
Ferruginous Hawk	2		8	4	3	1	2										
Rough-legged Hawk			1														
Golden Eagle	3	1	2	CW	2			1	1								
American Kestrel	26	1	6	11	27		5	28	1	2	9			2		2	1
Merlin	6			3	4	1	2	4	1		1			1	1		1
Peregrine Falcon															CW		
Prairie Falcon	4	1	1	CW	4			2									
Gray Partridge	64		8	25	7			15						3			2
Ring-necked Pheasant	22		8	3	28		5	21			1			1			
Spruce Grouse									2								
Ruffed Grouse		3	3	2				4	6	6	2			8	4		9
Sharp-tailed Grouse					3						2						
Wild Turkey					4												
Yellow Rail														4			
Virginia Rail														1			
Sora	14	2	2	2	3	1	1	20	3	2	24	4	1	83	4		13
American Coot	203		25	4	14	10+	26	143	1	3	382		1	198	20		32
Sandhill Crane							1	1						1	CW		
Black-bellied Plover	285				64		1	189						217	1		
Lesser Golden Plover	2													1			
Semipalmated Plover	1										1			1	1		
Piping Plover	3							1									
Killdeer	92	3	42	16	100	20+	3	57	8	2	31			27	12	14	4
Black-necked Stilt	3				18												
American Avocet	351		1	10	2	40+	12	240			6			115	200	1	
Greater Yellowlegs										4							1
Lesser Yellowlegs	1							20			7		3	16	4		1
Solitary Sandpiper					1			15	1		3				1		1
Willet	48		11	6	24	4	2	74						24	28		
Spotted Sandpiper	51	5	29	20	14	13	6	138	25	16	19		1	3	8	2	2
Upland Sandpiper	1			6	2			2									
Whimbrel	CW													1			
Long-billed Curlew	67		3	31	24	50+	9										
Marbled Godwit	67		4	63	58	40+	12	51			1			23	10	3	3
Ruddy Turnstone														5	1		2
Red Knot								2						22			
Sanderling								2						11	CW		
Semi-palmated Sandpiper	1			1	1		10	80						221	35		10
Least Sandpiper								18						7	30		
White-rumped Sandpiper	CW																
Baird's Sandpiper	25							8						5	20		
Pectoral Sandpiper								11						218	30		15
Dunlin														CW	CW		
Stilt Sandpiper							2	5							30		

1992 MAY SPECIES COUNT - BIRDS

SPECIES	LETH	WATE	CARD	CLAR	MEDH	SUFF	BIND	CALG	BANF	YAMN	REDD	COYL	GLEN	BEAV	ELKI	LACB	GRAN
Short-billed Dowitcher	2						3										
Long-billed Dowitcher	4							4						8			
Dowitcher sp.														6	50		
Common Snipe	6	1	18	4	6		4	30	15	2	8	4	1	39	5		4
Wilson's Phalarope	72	1	54	41	38	26	400	209			13			119	30		2
Red-necked Phalarope					1		50	6						18	800		
Franklin's Gull	795				127	2		944			411			100+	8	18	756
Bonaparte's Gull	1							42			9	2					
Mew Gull																	3
Ring-billed Gull	333	1	286	12	896	30	12	6634	1		1			68	10	2	41
California Gull	1140				48	50+		1240			14			9	11	1	55
Herring Gull						2		1									1
White-headed Gull sp.					133											230	
Caspian Tern	8							2									
Common Tern	155		5	3	16			48			9		1	2		6	
Forster's Tern	1							8						25	29		
Black Tern	23	7	22				3	215			421	10	10	300+	35		67
Rock Dove	121		60	75	819		6	212	6		32			18	40	1	1
Mourning Dove	126		24	22	143		36	26			9			2	2		
Great Horned Owl	22		7	18	4	4	4	1	5		11	4		3	3		2
Northern Hawk Owl											1						
Burrowing Owl	2			6	2	4		2									
Barred Owl													2				
Great Gray Owl											1		1				
Long-eared Owl							1?	1						1			
Short-Eared Owl	10										1			4			
Northern Saw-whet Owl	1										2						
Common Nighthawk			1					1			2			3			
Ruby-throated Hummingbird				1				3			7	2			2		
Calliope Hummingbird		CW							5	2							
Rufous Hummingbird		3		4				11	10								
Belted Kingfisher	4		3	2	3			5	10	1					1		
Yellow-bellied Sapsucker				9				8			8				6		1
Red-naped Sapsucker		6		2					1	2							
Downy Woodpecker	12	2	1	2	6		1	15		2	12	2		3	2		2
Hairy Woodpecker	1	2						2	5	1	13	1			5		4
Three-toed Woodpecker		1		2				2	1								
Northern Flicker	21	6	12	14	18		4	62	11	2	7	1		8	1		5
Pileated Woodpecker								3	4		5						
Olive-sided Flycatcher	1	6		1				6	7	4					1		
Western Wood Peewee	34	3	32	24	19			52	5	2	10	1		CW	5	2	5
Alder Flycatcher				2	1			1	2					16	3		
Willow Flycatcher	2	2		CW					11	1							
Least Flycatcher	37	19	18	41	31			258	8	34	59	6	1	254	40	28	13
Hammond's Flycatcher		2							1								
Dusky Flycatcher		2							9	5							
Cordilleran Flycatcher									3								
Empidonax Flycatcher sp.							10										

1992 MAY SPECIES COUNT - BIRDS

SPECIES	LETH	WATE	CARD	CLAR	MEDH	SUFF	BIND	CALG	BANF	YAMN	REDD	COYL	GLEN	BEAV	ELKI	LACB	GRAN
Eastern Phoebe				1				8			9	2	1	13	5	2	1
Say's Phoebe	4		4	CW	1			1									
Great Crested Flycatcher															CW		
Western Kingbird	77			36	85		5	17			1						
Eastern Kingbird	116	2	25	44	114	3	10	58	2	2	5	2	1	34	10		3
Horned Lark	572		54	326	114	3	70	73						1	CW		
Purple Martin											42			11	5		
Tree Swallow	51	6	34	101	18			218	141	8	279	10	1	288	40	7	19
Violet-green Swallow	2	CW							153								
N. Rough-winged Swallow	66		138	27	17			209	20						2		
Bank Swallow	289	3	36	46	18	2	2	381	16						35		
Cliff Swallow	918	520	164	185	85			167	220		269			100	100	70	
Barn Swallow	181	7	38	74	74		10	117	18		174		20	45	25	8	15
Gray Jay		13		2				4	20	2			1				
Steller's Jay		2															
Blue Jay	3			2	1			13			7	2		11	5		6
Clark's Nutcracker		1		8					5								
Black-billed Magpie	161	3	76	95	407		12	418	53	5	60			36	15	9	22
American Crow	96	2	38	127	59		18	206	56	3	68	2		57	15	19	36
Common Raven	5	3	15	33				55	34	10	7	2		1	1	8	2
Black-capped Chickadee	9	9	4	6	11			162	44	2	70	6	5	26	6	3	5
Mountain Chickadee				3				14	6	4							
Boreal Chickadee		2						13			4		1		CW		
Red-breasted Nuthatch	CW	30	4	11	4		3	60	41	8	6		1	CW	6		
White-breasted Nuthatch		1						6	2		17	2			3		
Brown Creeper								1	1								
Rock Wren	21	2		1	6			3		2							
House Wren	110	21	73	83	179		5	213		4	57	4	1	32	12	4	2
Sedge Wren														12			
Winter Wren		7															
Marsh Wren	17						1	22			5			68	2		
American Dipper		1							3	1							
Golden-crowned Kinglet		15			1			1	14						2		
Ruby-crowned Kinglet		51	2	4	1			47	61	19	1		2	CW	6	1	1
Mountain Bluebird	27	2	12	115			2	23	6	3	104	2		48	4	2	
Townsend's Solitaire		4		1					3	6							
Veery		5		1				16			4			1	2	1	
Gray-cheeked Thrush														1			3
Swainson's Thrush	17	9	6	12	3		4	45	14	3	1		1	11	3		
Hermit Thrush		18	12		1			3	5	19				CW	2		
American Robin	291	60	154	87	382	2	5	357	127	28	140	6	1	45	35	37	27
Varied Thrush		22			1				6								
Gray Catbird	29	5	4	14	10		4	5			1	2		2	3		
Northern Mockingbird	CW			CW													
Brown Thrasher	21		2	2	43	3	12	5						1			
American Pipit				CW				9									
Sprague's Pipit	2				2		1	11						CW	2		
Bohemian Waxwing									12								

1992 MAY SPECIES COUNT - BIRDS

SPECIES	LETH	WATE	CARD	CLAR	MEDH	SUFF	BIND	CALG	BANF	YAMN	REDD	COYL	GLEN	BEAV	ELKI	LACB	GRAN
Cedar Waxwing	17	2	1	32	14			15	3		7	4		4	CW		7
Loggerhead Shrike	3				6		13										
European Starling	339	13	156	192	772	15	26	550	13		74			62	15	70	14
Solitary Vireo				2				1	5	2				CW			
Warbling Vireo	22	18		4	39			36	24	28	15			34	3	1	
Philadelphia Vireo											4		1	1			
Red-eyed Vireo	3			1	4			15	1	2	13	2		16	6	13	
Tennessee Warbler				CW			3	12	2	2	11			7	2	3	2
Orange-crowned Warbler	CW	3			1			10	4	4				CW		1	
Yellow Warbler	102	34	54	41	339		6	337	10	4	49	4	4	201	15	32	32
Magnolia Warbler				CW										5	1		
Cape May Warbler														CW			
Yellow-rumped Warbler	CW	28	1	1			1	39	41	20	10		1	12	6	3	
Townsend's Warbler		4		CW					12	1							
Black-thr.-green Warbler																2	
Blackburnian Warbler															CW		
Palm Warbler														CW			
Blackpoll Warbler				1			1	23	1					9			
Black & White Warbler	1							2						CW	2		
American Redstart				CW			3		3	1	4			19			1
Ovenbird					1			7		5		1	1		7	4	
Northern Waterthrush				CW				5	4	3				CW			
Connecticut Warbler														CW	1	2	
Mourning Warbler							1							5	1		
MacGillivray's Warbler		20		3					5	3							
Common Yellowthroat	19	6	3	5	23	1	5	13	22	2	2	1		18	4	6	1
Wilson's Warbler	1	12		1				13	6	2				CW		1	2
Canada Warbler														CW			
Yellow-breasted Chat					1		1										
Western Tanager		5			1			16	1		3			CW	1		
Rose-breasted Grosbeak				CW	3			12		2	8			1	3	2	1
Black-headed Grosbeak		4															
Lazuli Bunting					1												
Rufous-sided Towhee	15	CW			30		23										
American Tree Sparrow																	5
Chipping Sparrow	29	33	9	174	17	3	85	505	60	22	34		2	3	7	3	
Clay-colored Sparrow	95	6	12	21	39		11	583	10	3	59	2	1	46	12	11	15
Brewer's Sparrow	14				3			1									2
Vesper Sparrow	95	1	18	157	57		33	97	5	3	6			15	4	3	7
Lark Sparrow	18		2	1	69	6	15										
Lark Bunting	47			CW	94	4	104								CW		
Savannah Sparrow	91	5	63	117	50		8	268	3		35			84	6	13	137
Baird's Sparrow	2				2			2									
Grasshopper Sparrow	7				9												
Le Conte's Sparrow				1	1			15	1		15		1	23	2	5	
Sharp-tailed Sparrow														22	1		
Fox Sparrow		11															
Song Sparrow	22	10	6		5		2	41	7	3		4	2	21	15	11	8

1992 MAY SPECIES COUNT - BIRDS

SPECIES	LETH	WATE	CARD	CLAR	MEDH	SUFF	BIND	CALG	BANF	YAMN	REDD	COYL	GLEN	BEAV	ELKI	LACB	GRAN
Lincoln's Sparrow				CW				33	10	6				2	5	2	1
Swamp Sparrow									1			2		CW	5	1	
White-throated Sparrow								62		7	31	12	1	CW	15	13	8
Golden-crowned Sparrow																	2
White-crowned Sparrow	4	28	16	17			1	19	15	4	2						5
Dark-eyed Junco	1	23		7				52	64	19	30	4	1		4		
McCown's Longspur	4				3		13										
Chestnut-col. Longspur	250		11	18	60	2	32										
Bobolink	3				1									11			1
Red-winged Blackbird	666	23	174	82	469	6	34	620	60	12	294	30	15	505 +	450	56	204
Western Meadowlark	252	8	83	87	422	30	53	123		1	1			12	2	1	
Yellow-headed Blackbird	1455	6	126	15	228	50 +	6	378	1		209		1	351 +	10	2	30
Brewer's Blackbird	176	18	52	103	241	10	38	231	5		68			56	17	1	19
Common Grackle	66		11	CW	167			7				2		2	2	2	5
Brown-headed Cowbird	147	5	43	87	91	1	10	212	44	11	39	4	2	136	35	60	48
Northern Oriole	62		19	35	102		3	157	2		50	4	1	172	25	14	15
Pine Grosbeak		5															
Purple Finch				CW				5			10	8	1		10		7
Red Crossbill		6			2												
White-winged Crossbill	2	2			3			14							CW		
Pine Siskin		61	10	54				57	163	13	45		30	1	8	3	20
American Goldfinch	68	9	60	56	76		50	80			96	1	4	48	12	6	
Evening Grosbeak	1							6			5	2			1		3
House Sparrow	556		242	231	912		6	480	10		72			54	16	5	5
Total Birds	1607[illegible]	1382	4481	4595	10171	904	1726	24869	2237	479	6621	228	215	8817 +	4629	1432	4260
Total Species	145	96	102	116	133	51	92	177	112	76	124	55	55	138	139	75	102
Add't'l Count Week Species	8	3		16										19	14		
Observers	40	16	7	7	18	2	3	47	16	7	38	3	8	20	3	2	2

Author's address:
20 Lake Wapta Rise SE, Calgary, AB T2J 2M9.

FAN's May Species Count is held on the last weekend in May. This year May 29-30.

Send your May Species Count for Birds and Mammals data to: Curtis Pollock
Box 1844, Vermilion, AB
T0B 4M0.

The deadline for FAN project reports are July 15th.

For Reference
Augustana University College
Library
Not to be taken from the library

APR 11 1994

Volume 24, Number 1

Spring 1994

ALBERTA NATURALIST

Alberta's Natural History Review

Sightings of Northern Leopard Frogs - Attracting Toads - NAFTA
Leadership in Grassland Conservation - Butterfly Gardening - Official Counts in Alberta
Preserving Heritage - Snow Goose Festival - Pileated Woodpecker - The Canid Equation

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CONTENTS

President's Page........1

Editor's Page........2

Public Sightings of Northern Leopard Frogs, David Seburn.......3

How to Attract Toads, Godo Stoyke........5

NAFTA Environmental Secretariat Initiative Background Document........6

Municipality Shows Leadership in Grassland Conservation.......7

Butterfly Gardening in Alberta, Godo Stoyke........8

Preserving the Heritage, Richard Bronstein........10

The First Official Butterfly Counts in Alberta, John Acorn and Elizabeth Savoy........11

Second Annual Snow Goose Festival at Beaverhill Lake, Harry Stelfox........12

Habitat Ecology of the Pileated Woodpecker in Alberta, Rick Bonar........13

The Canid Equation, Dick Dekker........16

Book Reviews........19
  Which Deer is That? - Hoofed Mammals of Alberta
  Atlas of Breeding Birds of the Maritime Provinces

Field Trips - FAN Meeting at Calgary, January 30/94, Ruth Powell and Dick Clayton........20

Editor: Jane Livingston, FAN, Box 1472, Edmonton,
Alberta T5J 2N5.

Executive Assistant: Ann Stefura
Printing: Percy Page Centre
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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, Curtis Pollock, Box 776, 100 Mile House, B.C. V0K 2E0.
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forest Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Honorary Member: Professor W. Ray Salt

Patron: Hon. Dr. J.W. Grant MacEwan

The Federaton of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or orther features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

BOARD OF DIRECTORS

Past President: Barry Jenkins, 20 Forest Drive, St. Albert, AB T8N 1X2.

President: Harvey Gardner: R.R. #1, Nanton, AB T0L 1R0.

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Recording Secretary: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0.

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Alberta Native Plant Council, Box 52099 Garneau, Postal Outlet, Edmonton, AB T6G 2T5.
Alberta Speleological Soc., 125 Hawkville Close N.W.,Calgary, AB T3G 3C3.
Bow Valley Naturalists, Box 1693, Banff, AB T0L 0C0.
Buffalo Lake Naturalists, Box 1802, Stettler, AB T0C 2L0.
Calgary Field Naturalists' Society., Box 981, Calgary, AB T2P 2K4.
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Lethbridge Naturalists' Society., Box 1691, Lethbridge, AB T1J 4K4.
Peace Parkland Naturalists, Box 1451, Grande Prairie, AB T8V 4Z2.
Red Deer River Naturalists, Box 785, Red Deer, AB T4N 5H2.
Vermilion River Naturalists, Box 1769, Vermilion, AB T0B 4M0.

Associate Members: Beaverhill Bird Observatory
Earth Care Peace Study Centre

President's Page

Harvey Gardner

Thank you FAN and all members I have met for broadening my horizons and views of this province. Years ago I regarded Edmonton as "northern", Calgary as "central" -- until FAN gave me a legitimate reason to really look at the province as a whole.

I was raised here on the ranch when the roads were really wagon trails and Local Improvement District meant that if you want the road fixed you fixed it yourself. I clearly remember our neighbours building corduroy roads and moving dirt with horses.

I was strongly influenced by local trappers (at least one of whom is also a FAN member) and Stoney Indians to realize the complexity and interdependence of ecosystems. Most of my play-mates were Stoneys, though I'm ashamed I learned very little of their language. Certain Stoneys had an understanding of medicinal uses of plants, etc. but did not much discuss these with "white savages". Understand that every male (and most females) of this "hillbilly" area were also cowboys.

My parents and several neighbours were members of the Society for Range Management and attended meetings and field trips throughout southern Alberta, so we learned some plant identification and again the complexities of ecosystems.

My formal education grades one through nine were at home through Alberta Edmonton correspondence courses which enabled Mother (who guided me and made sure I did the work) and me to concentrate on school at times and take full part in ranch activities at others. In the fall of 1951, I started grade nine at Principia Upper School, St. Louis, Mo., U.S.A. where I "enjoyed" a career as an indifferent student, took park in athletics, and even had a brief stint as president of the John Muir Club. I graduated in June 1955. Colorado A&M College accepted me into their Animal Production program and there again I was an indifferent scholar, but took park in a full schedule of extracurricular activities including track team, rodeo, square dance and the Christian Science Organization on campus. To people who seem overly impressed by degrees I simply say that I attended Colorado State University for six years, leaving out that I was a part time student. (The name change happened while I was there). My only degree is in Equine Podology (horseshoeing) from Cal. Poly, San Luis Obispo, California.

My introduction to FAN was through the Alberta Speleological Society which I still attempt to represent, though I have not done any cave exploring for several years.

FAN seems an excellent forum to put forward the concept of holism in the environment. Everyone affects everyone else, though the effect may not be apparent. Riparian areas do not end at the edge of their flood plains and forests do not end at stream banks. My hope is to foster cooperative attitudes between user groups so that those who have "consumptive" activities can contribute to the general economy without impairing the treasures valued by "non-consumers".

I do not mean to claim any expertise in botany or any other field--only that "complex" is too simple a word to describe any ecosystem or issue. The only thing that seems truly simple is that thing which one knows nothing about.

Author's Address:
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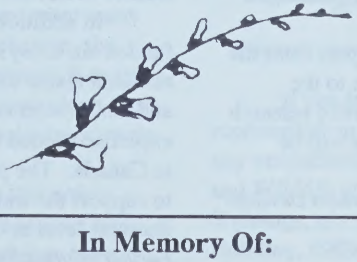


In Memory Of:

Eileen Coffey, Membership Secretary since May 1981, died on February 24, 1994. Her long contribution to FAN will be missed by all of us. Eileen kept the membership records; addresses, name changes and all, and "knew" everyone of you. Over the years she held many other commitments but always found time to work for FAN. Even when sick she insisted on fulfilling her obligations and assisting in the Alberta Naturalist mail-outs.

Editor's Page

Fish and Wildlife Conference Attracts Over 150 Northerners

Over 150 hunters, fishermen and resource managers met at the Fish and Wildlife in Northern Alberta Conference in Grande Prairie on December 2 and 3. They discussed how to increase community involvement in fish and wildlife management in the north. The northern Alberta Development Council (NADC) sponsored the event.

Guest speakers included Brian Evans, Minister of Environmental Protection, Mike Cardinal, Minister responsible for Native Affairs, and Johnsen Sewepagaham, chief of the Little Red River Cree and member of the Environment Committee of the Grand Council of Treaty 8 First Nations.

"Delegates told us the conference was a success," said Wayne Jacques, NADC Chairman and MLA for Grande Prairie-Wapiti. "Many communities of fish and wildlife users were represented. Fish and wildlife managers had an active role, too."

Keynote speaker Les Cooke set the tone by saying the government needs to work cooperatively with communities on fish and wildlife issues. This would mean delegating greater decision-making authority to the local level. Cooke has overseen similar changes in Saskatchewan as the associate deputy minister of Saskatchewan Environment and Resource Management.

Delegates supported the ideas of co-management and greater community involvement. Many commented that the conference was an important step in that direction, and saw the next step as spelling out exactly what "co-management" means.

Discussion topics included treaty and aboriginal issues, forestry and the use of local knowledge in resource management decisions. Conference delegates exchanged ideas in small groups and workshops.

The NADC will prepare a summary report from the conference that will contain recommendations to the provincial cabinet. A summary of pre-conference research findings will also be printed. Both documents will be available early in the new year.

Contact: Greg Halinda, Information Officer, Northern Development Branch, Edmonton (403) 422-9176.

* * * * * * * * * *

The Alberta Naturalist reserves the right to edit submitted copy. Due to space restrictions some articles may be shortened; every effort will be made to maintain content and context of all submissions. Grammar and syntax changes will be made as necessary.

University of Alberta Awarded Chair In Environmental Risk Management

Federal Environment Minister Pierre H. Vincent announced recently that the University of Alberta has been awarded a university research chair in environmental risk management. The chairholder is professor Steve Hrudey.

This is the first chair to be funded under the Green Plan's Eco-Research program. The program will contribute $1.6 million to the chair over five years.

Dr. Hrudey, a teacher and researcher with over 20 years of experience, will focus on defining and managing environmental risk. His program will link researchers from many disciplines ranging from environmental and occupational health to adult education, business and engineering.

Under the Eco-Research program, chairs are awarded to highly qualified and internationally recognized researchers. They will serve as important focal points for strengthening cross-disciplinary research and training in environmental studies in Canada.

"By encouraging and supporting the training of environmental experts, this new chair will help meet an important goal of the Green Plan to better understand complex environmental issues facing Canadian society," said Minister Vincent.

The Eco-Research Program is a six-year training and research program in environmental studies which focuses particularly on the interactions between humans and the environment. It also encourages partnerships among universities, industries and all levels of government.

The program is administered by the Social Sciences and Humanities Research Council (SSRCH), the Natural Sciences and Engineering Research Council, and the Medical Research Council, through a tri-council secretariat located at SSHRC.

In addition to this research chair, the program has funded six ecosystem research grants. The grants assist research teams that combine skills from the social, natural and health sciences and engineering disciplines build the expertise needed to better understand regional ecosystems in Canada. The program has also awarded 64 fellowships to support the training of environmental scientists at the doctoral level at Canadian universities.

Further information: Pamela Wiggin, Social Sciences and Humanities Research Council (613) 992-0691, John Hollins, Environment Canada (819) 994-5167, Katherine Thibault, Environment Canada (819) 994-4121.

Cover: Watercolour painting of the Pileated woodpeckers by Norma Bonar.

Public Sightings of Northern Leopard Frogs

David Seburn

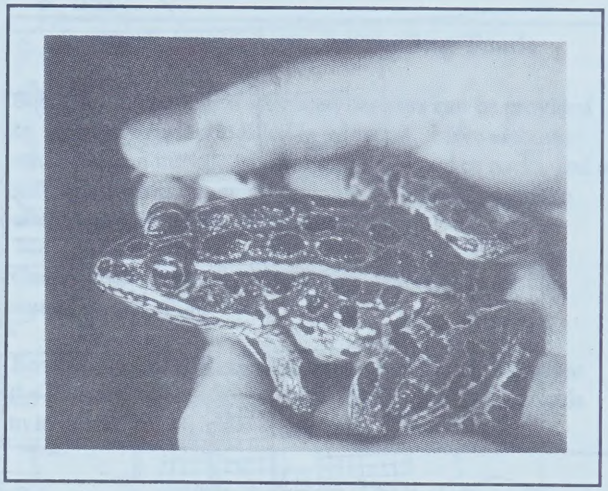
Around the world there has been growing concern over declining amphibian populations. Populations have declined in areas affected by human activity but also in relatively pristine areas, where the effects of human development and pollution should be minimal. While it is unlikely that there is only one global cause there are a number of factors which have likely contributed to the decline. Acid rain, increased ultraviolet light, pesticides, and the draining of wetlands are all causes that are frequently cited. One reason that amphibians may be affected is that they lead a dual life. Frogs start off in the water as tadpoles and then transform into a terrestrial creature. Amphibians also have permeable skin and hence they are sensitive to water pollution. Because of this they act as a proverbial canary in a coal mine, providing an indication of the health of their ecosystem.

In Alberta, the species that has been most dramatically affected is the Northern Leopard Frog. While they were once a common sight in central and southern Alberta, in the late 1970s Leopard Frogs vanished from many of their known breeding sites (Roberts, 1981).

In response to this, Alberta Fish and Wildlife in conjunction with World Wildlife Fund, mounted a poster campaign to solicit information from the general public. Wanted Posters for the Leopard Frog appeared in many places across the province. The response was overwhelming. Over 200 reported sightings were submitted to Fish and Wildlife (Seburn, 1993).

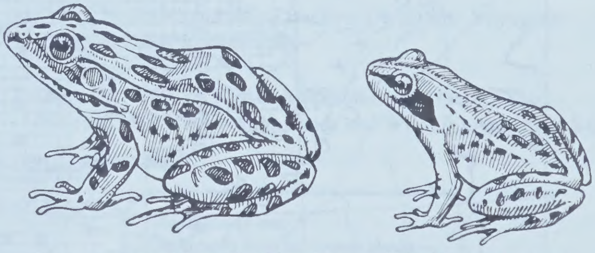
Almost half of these sightings came from southern Alberta, mainly the Medicine Hat area, the Cypress Hills, and along the Milk River. The majority of the rest of the sightings came from central Alberta. A trend that quickly became apparent was that the distribution was centred along the major rivers of the province. There were many sightings along the Milk, the South Saskatchewan, the Bow, and the Red Deer Rivers. Current research is examining whether or not leopard frogs can disperse along these aquatic corridors and possibly naturally recolonize historic breeding sites.

The distribution map accompanying this article illustrates each township and range that had at least one sighting reported from it. Two types of markings have been used on the map: confirmed sightings and those that are still unconfirmed. Unfortunately, identifying amphibians in the field is not always easy. Leopard Frogs are often incorrectly identified as Wood Frogs. Wood Frogs are smaller, tend to have fewer spots, and have black face masks. Leopard Frogs can be either green or brown and can be identified by their dark spots with a pale ring surrounding the spots.



Leopard Frog Photo: C. Seburn

Because of the problem of incorrect identification only those records that came with an accompanying photograph of the animal in question, or were confirmed by Fish and Wildlife were mapped as confirmed records. Aside from one confirmed sighting in the extreme north-east of the province (which likely represents a disjunct population of Leopard Frogs), all confirmed sightings are from south of Red Deer.



Northern Leopard Frog (50-130mm) Wood Frog (30-80mm)

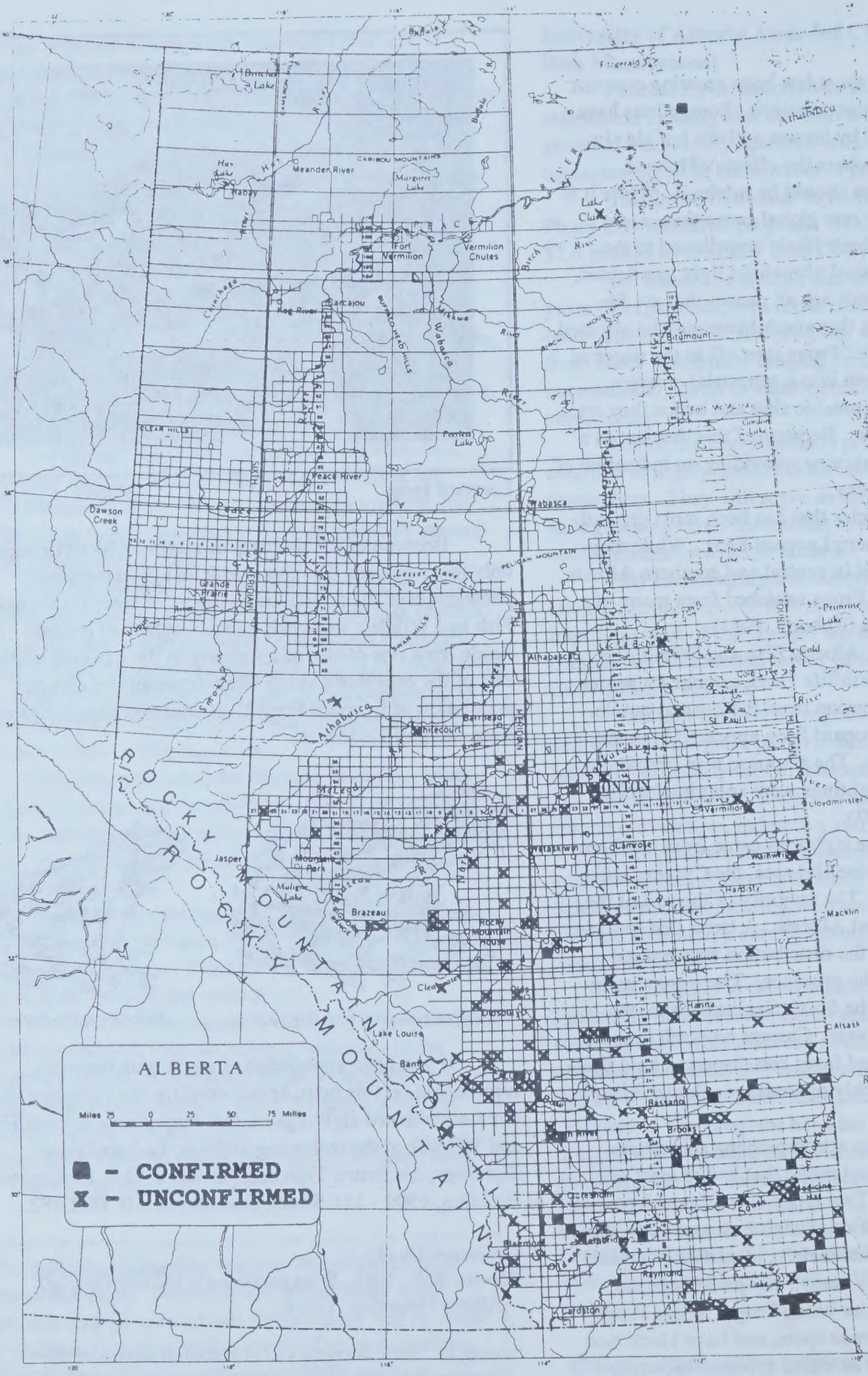
If you have knowledge of any populations not represented on this map, or can confirm the existence of any unconfirmed sightings on this map please contact Fish and Wildlife at the following address: Leopard Frog Sightings, c/o Bruce Treichel, 7th Floor, O.S. Longman Building, 6909 - 116 Street, Edmonton, AB T6H 4P2.

Literature Cited

Roberts, W.E. 1981. What happened to the leopard frog? Alberta Naturalist. 11:1-4.

Seburn, D. 1993. Summary of observation reports of the Northern Leopard Frog in Alberta, 1990-1992. Alberta Department of Environmental Protection. Fish and Wildlife Services.

DISTRIBUTION OF LEOPARD FROG SIGHTINGS IN THE PROVINCE


ALBERTA
Miles 25 0 25 50 75 Miles
■ - CONFIRMED
X - UNCONFIRMED
ROCKY MOUNTAINS
ROCKY MOUNTAIN FOOTHILLS
Lake Athabasca
Fitzgerald
Lake Claire
Fort Vermilion
Vermilion Chutes
Hay Lake
Rainbow
Meander River
CARIBOU MOUNTAINS
Bistcho Lake
Peace River
Fort McMurray
Bitumount
Clear Hills
Dawson Creek
Grande Prairie
Lesser Slave Lake
Wabasca
Peerless Lake
Athabasca
Lac La Biche
Cold Lake
St. Paul
Barrhead
Whitecourt
Edmonton
Vermilion
Lloydminster
Camrose
Wetaskiwin
Wainwright
Hardisty
Macklin
Jasper
Maligne Lake
Brazeau
Rocky Mountain House
Red Deer
Hanna
Drumheller
Didsbury
Olds
Lake Louise
Banff
Oliver
Alsask
Bassano
Brooks
Medicine Hat
Claresholm
Pincher Creek
Lethbridge
Raymond
Cardston
Blairmore

Author's Address:
704 - 2nd Michener Park, Edmonton, Alberta T6H 5B5.

How to Attract Toads

Godo Stoyke

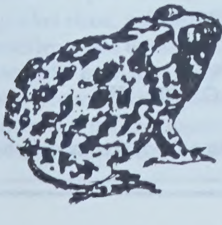
Toads have been much maligned. Creatures mostly of the night, covered with "warts", they used to be associated with the evil activities of witches. Even now we say "ugly as a toad".

But toads are creatures which have a beauty of their own. There is an archaic and primeval splendour about their squat, gland-covered bodies and the way toads often sit motion-less for long periods of time, self-sufficient, simply staring. Their relatively dry skin is better adapted to dry, terrestrial habitats than the moist skin of the more aquatic frog. Toads cannot only hop, but -unlike frogs- can also run swiftly using their feet alternately. When running like this they appear almost mouse-like at first glance.

There are five species of true toads in Canada, three of which can be found in Alberta: the Western Toad *(Bufo boreas)*, the Canadian Toad *(Bufo hemiophrys)*, and the Great Plains Toad *(Bufo cognatus)*. Toads can roam widely from the pond or slough in which they breed. Their summer hunting quarters can be as much as 1 km away from their breeding grounds (though usually much less). Toads feed on a wide variety of insects, including adult beetles, ants, and cut-worms. In the wild, toads often adopt deserted rodent burrows for shelter, or they dig their own. In our garden, a toad is living in an old woodchuck burrow. If you live in the city and are within about 1 km of a body of water, you can help to attract a toad to your backyard by providing an artificial burrow. A "rock garden" used to grow alpine plants allows toads to prepare their own burrow. Or you can create a cavity whose ceiling is supported by wood or flat rocks. Bill Merilees, author of Attracting Backyard Wildlife, recommends lining the bottom of the cavity with soft sand.

One difficulty in attracting toads in the city is the high population of cats and dogs which kill toads. However, toads can secrete substances which are highly irritating to mucous membranes. Predators are therefore less likely to attack a toad a second time. On the other hand, there is no defence against "predatory" cars.

The other difficulty can be the absence of water. A body of fresh-water is required to provide an area where toads can deposit eggs. (Toad eggs are laid in long strings, while frogs lay eggs in clumps.) If you are not in the vicinity of a pond already, you can create your own pond if some space is available to you.



Canadian toad

Quick-Summary: Attracting Toads

Solution: Opportunities for toad burrows can be provided by creating a rock pile filled in with soil. More elaborate structures can include cavities lined in wood or rocks, and a soft sand bottom. A small drainage or other pipe can be used to provide a burrow entrance.

Cost: Free. Requires a few square metres of space and some labour.

Environmental Effects: The presence of toads increases the diversity of organisms found in your garden and leads to increased ecological balance.

Acknowledgements

Wayne Roberts, curator of the University of Alberta Zoology Museum, provided helpful criticism of a draft article.

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Behler, J.L., and King, F.W. 1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopt, New York.

Froom, B. 1982. Amphibians of Canada. McClelland and Stewart, Toronto.

Merilees, B. 1989. Attracting Backyard Wildlife. Voyageur Press, Stillwater, Minnesota.

Roberts, W. 1982. A Key to Amphibians of Alberta. The Steward (Alberta Forestry, Lands and Wildlife) April (18):5-6.

The ungainly toad
That crawls from her secure abode,
Within the mossy garden wall,
When evening dews begin to fall.
Oh, mark the beauty of her eye,
What wonders in that circle lie!
So clear, so bright, our fathers said-
'She wears a jewel in her head'.
William Shakespeare
As You Like It

Author's Address:
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Edmonton, Alberta T6E 1X7.

Reprinted from Applied Ecology, the Newsletter of Environmental Solutions, Volume 1, Number 1, Summer 1993.

NAFTA Environmental Secretariat Initiative Background Document

Although there may be varying opinions as to the extent of the benefits or threats to particular sectors affected by the NAFTA Agreement, now that the trade deal has been ratified by all three countries a significant opportunity exists for Edmonton and Alberta to influence the international community and show-case its environmental and related strengths to the world.

Unlike the Canada/US Free Trade Agreement, NAFTA and its two side agreements set up three relatively independent bodies. Two of these bodies, the Labour Secretariat and the Environmental Secretariat, will be significant international bodies with a high level of technical responsibility and independence.

The Environmental Secretariat, with a proposed initial $20 million annual budget and likely the largest number of scientific and other jobs of these three bodies, will be in Canada. In general terms, the Environmental Secretariat will provide technical, administrative and operational support of environmental co-operation under NAFTA. It will also have much to do with encouraging the harmonization of North American and international environmental directions. There would also be significant positive economic, cultural and social impacts on our community.

To secure the NAFTA Environmental Secretariat for Edmonton, an independent task force, instigated by the Edmonton Chamber of Commerce ("Chamber") and with the support of Economic Development Edmonton ("EDE"), is being led by Mayor Jan Reimer. Unanimous agreement to proceed with the NAFTA Environmental Secretariat initiative was obtained on November 16, 1993 at City Hall from representatives of the Chamber, EDE, the Environmental Law Centre, the Environmental Services Association of Alberta and the University of Alberta. Other organizations are now supporting the initiative and helping by communicating our desire to have the NAFTA Environmental Secretariat in Edmonton and the strong reasons why Edmonton is an ideal location for the Secretariat. Federal civil servants, Edmonton area federal, provincial and municipal politicians, and representatives from business, labour, education, cultural and non-government organizations are being contacted. Mayor Jan Reimer is sending various letters to relevant politicians.

A formal proposal is also being written with the co-operation of and input from the above parties as well as other members in the community. The proposal will explain Edmonton's accessibility and strengths, including our electronic highway systems, excellent transportation service to Mexico City and Washington D.C., exceptional hotel, meeting and convention facilities and outstanding organizational and institutional support. The formal proposal will also highlight Edmonton and area's low cost of living and high quality of life. The history of our environmental achievements, including our strong environmental record and our incredible environmental resources, are being detailed.

Although a group of individuals is working diligently towards having the federal government designate Edmonton as the location for NAFTA's Environmental Secretariat, we would welcome assistance and support from any and all members of the community. Support can be by:

* backing the initiative by writing the Mayor of the City of Edmonton and any or all of the politicians,
* allowing your organization's name to be included with the proposal advocating the initiative; or
* providing input into the formal proposal writing process.

When you write your letter of support, add from your experience why Edmonton is a great City to live in or to do business in.

Consistent with Edmonton's Economic Development Strategy, it is time for Edmontonians to be pro-active and capture an institution that would secure our ability to be a world centre of a knowledge based industry, the environmental industry. With all of your help we will succeed!

For further information contact either Cheryl Knebel at 940-6889 or Andrea Moen at 423-7306, the Co-chairs of the Task Force. A joint facsimile number is 423-7276, and you may correspond with them by addressing your correspondence to the Environmental Secretariat Initiative in care of #2900, 10180 - 101 Street, Edmonton, Alberta T5J 3V5.

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(604) 348-2508

* Fees cover all tour expenses including food, accomodation and transportation.

Municipality Shows Leadership in Grassland Conservation

An eastern Alberta Municipality is demonstrating environmental stewardship in action through a special plan to manage its native prairie and to protect environmentally significant areas.

In 1990, the Municipal District of Acadia was considering selling tax recovery lands. But after hearing about the Prairie Conservation Action Plan, it started a process that has resulted in a land exchange and a management agreement with the province's Public Lands Division.

Some 3,040 acres were transferred to the Public Lands Division with the municipality receiving 1,895 acres of "high capability" agricultural lands in exchange. Another 8,640 acres will be held by the municipality and managed by Public Lands through long-term grazing leases.

The whole arrangement was based on a study to determine any environmentally significant areas. The study revealed a variety of upland, wetland and river valley sites, some of provincial and national significance.

"This is shared stewardship in action," says Brian Evans, Minister of Environmental Protection. "I salute the cooperation and foresight of the Municipal District of Acadia, the ranchers who lease the land and the provincial government agencies and their staffs involved. The leadership and commitment in this project are commendable."

Walter Paszkowski, Alberta Agriculture, Food and Rural Development's minister agrees. "The long-term arrangement will provide economic stability for area ranchers who lease the native rangeland. It will also demonstrate that use is compatible with the continued protection and conservation of wildlife habitat, the native mixed grass prairie landscape and associated plants and animals."

Shirley McClellan, MLA for Chinook and Minister of Alberta Health stated, "As the elected representative, I am pleased to have participated in the cooperative negotiations between the Alberta Government and the residents of the Municipal District of Acadia. The protection of the native mixed prairie grassland will be appreciated by generations of Albertans."

Background Information
Prairie Conservation Action Plan

The Prairie Conservation Action Plan is a five-year blueprint aimed at conserving the biological diversity found on the prairies. The plan was part of the World Wildlife Fund, Canada's 'Wild West' program, and was developed by a steering committee of people from across the prairie provinces, including representatives from Alberta Environmental Protection.

The Prairie Conservation Coordinating Committee, comprised of representatives from non-government agencies, environmental interest groups, agriculture, industry, academia, as well as provincial and federal agencies, was established to ensure that the goals of the Prairie Conservation Action Plan are carried out. The committee provides a forum for information exchange and cooperation between diverse groups whose interest, jurisdiction or activities affect native prairie parkland environments.

On the occasion of the inaugural meeting of the Prairie Conservation Coordinating Committee on November 17 & 18, 1989, then Minister of Forestry, Lands and Wildlife LeRoy Fjordbotten stated, "The Prairie Conservation Coordinating Committee is the largest multi-partite committee of its kind ever established in Alberta. He went on to say "Focus on the conservation of prairie parkland ecosystems is both timely and challenging. With the experience, commitment and support of the partners of this committee, conservation of Alberta's prairies, and the recovery of rare and vulnerable prairie species will be promoted and enhanced."

Contact:
Dwight Dibben/Brian Hlus, Agriculture, Food and Rural Development, Minister's Office, (403) 427-2137 Fax: (403) 422-6035.
Nancy Boutilier, Agriculture, Food and Rural Development, Medicine Hat, (403) 529-3677 Fax: (403) 529-5213.

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Butterfly Gardening in Alberta

Godo Stoyke

There are about 150 different species of butterflies in Alberta. Some of them are generalists who will feed on a wide variety of plants. Others are limited to a few or even one species of plant for food. One effective way of attracting butterflies to your garden is by providing plants which are good sources of nectar. Another way is providing plants which are a food source for the butterfly's larva, the caterpillar. Finally, there are a number of ways in which you can attract butterflies even without any plants. For example, butterflies will drink from rotting and fermenting fruits, and they collect salt from mud puddles.

The table on the following page provides a list of plant nectar sources for the adult butterflies. It is preferable to plant species which are native to this province since our butterflies are adapted to using them. Native plants will also provide food for a variety of other organisms. Food plants for caterpillars are generally not the same as for the adults. Different species require specific food plants. For example, caterpillars of the White Admiral *(Limentis arthemis)* feed on birch and aspen leaves. Western Swallowtail caterpillars *(Papilio glaucus)* feed on members of the carrot family. Caterpillars of the Meadow Fritillary *(Boloria bellona)* feed on violets. And a number of caterpillars feed on sedges and grasses (yes, including crabgrass).

Here are some ways in which you can attract butterflies without plants. Nearly all adult male butterflies love to take up water from mud puddles. They are not looking for water, since they obtain large amounts of fluid through the nectar on which they feed. Instead, they are looking for salts which are found in higher concentrations in areas where most of the water has evaporated. You can provide salt feeding areas by occasionally wetting down a soil or sand depression. In their search for salt, butterflies also like to feed on carrion or animal droppings (these may not be your favourite additions to the garden). Butterflies and many moths will feed on fermenting or rotting fruit which can be left outside in a sunny location. If the fruit has been fermenting long enough, the insects may actually become intoxicated and will leave with unsteady flight. A similar mixture can be concocted by mixing honey and beer and smearing it on a tree trunk or other surface. Brush piles and loose bark help protect overwintering butterflies in winter.

Some butterfly species prefer to have trees nearby. Trees can be used as perches by the males of butterfly species which establish territories for mating. These butterflies will defend their areas from other males and have even been observed to chase away dragonflies and birds.

Quick-Summary: Butterfly Gardening

Solution: Plant native flowers and shrubs. You can start with a few plants in a balcony flower pot. (However, butterflies will have a harder time finding the flowers. Also, butterflies often specialize on one kind of flower for feeding for a while. Therefore, smaller patches are more likely to be ignored.) Or you can plant whole sections of your garden. If no private space is available to you, you can request your land-lady or land-lord to lighten up the monotonous lawn with some butterfly flower. You can also ask your town or city council to devote sections of public land (e.g. road-sides and city parks) to butterfly gardening.

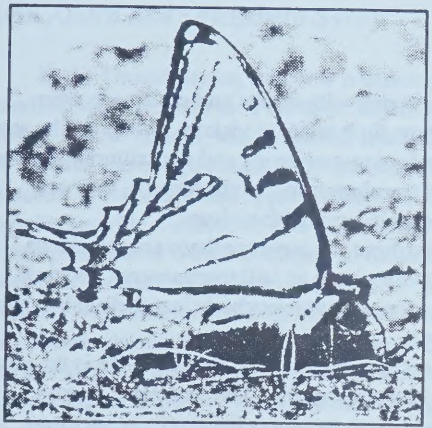
Cost: From nearly free to more expensive. Home-grown plants from seeds or cuttings are the cheapest way to obtain butterfly plants. Ready-to-transplant, bought plants are the most expensive, but also the fastest and easiest to obtain. Prices range from a few dollars for a package of seed, to $3.95 to $9.95 for many grown plants, more for shrubs.

Environmental Effects: Butterfly population densities are ultimately limited by the amount of suitable habitat present. Butterfly plants provide important food sources for adult and larval stages. Native plants benefit a wide variety of wildlife species other than butterflies, leading to increased overall diversity.

Acknowledgments

Terry Thormin, invertebrate zoologist at the Provincial Museum of Alberta, identified butterfly species and made helpful comments. Ian Sturges, botanical editor, reviewed plant lists. The table of butterfly plants is based on: Stoyke, G. 1992, Environmental School Program: A teacher's Guide. Friends of the University of Alberta Devonian Botanic Garden, Edmonton.

Butterfly Flowers



Swallowtail butterfly "puddling" Terry Thormin

Native Wildflowers

Aster species	*Aster spp.*
Blazing Star	*Liatris spp.*
Blueberry, Grouse-berry etc.	*Vaccinium spp.*
Cone-flower, Prairie	*Ratibida columnifera*
Crane's-bill	*Geranium spp.*
Dogbane, Spreading	*Apocynum androsaemifolium*
Fireweed	*Epilobium angustifolium*
Fleabane, Wild Daisy	*Erigeron spp.*
Forget-me-not	*Myosotis spp.*
Gaillardia	*Gaillardia aristata*
Golden "Aster"	*Heterotheca villosa*
Goldenrod	*Solidago spp.*
Groundsel, Ragwort	*Senecio spp.*
Haplopappus	*Haplopappus lanceolatus*
Heal-all	*Prunella vulgaris*
Hyssop, Giant	*Agastache foeniculum*
Lupin	*Lupinus spp.*
Milkweed, Showy	*Asclepias speciosa*
Mint	*Mentha spp.*
Mint, Horse; Wild Bergamont	*Monarda fistulosa*
Onion species	*Allium spp.*
Pea Vine, Yellow Sweet	*Lathyrus spp.*
Prickly Pear Cactus	*Opuntia spp.*
Puccoon	*Lithospermum spp.*
Stonecrop	*Sedum spp.*
Strawberry, Wild	*Fragaria virginiana*
Sunflower species	*Helianthus spp.*
Sweetvetch	*Hedysarum boreale*
Thistle species	*Cirsium spp.*
Vetch, Milk	*Astragalus spp.*
Vetch, Wild	*Vicia americana*

Introduced Wildflowers

Alfalfa, Lucerne	*Medicago sativa*
Clover, Red	*Trifolium pratense*
Clover, White; Dutch Clover	*Trifolium repens*
Dandelion	*Taraxacum officinale*
Sweet Clover, White	*Melilotus alba*
Sweet Clover,Yellow	*M. officinalis*
Yarrow	*Achillea millefolium*

Shrubs

Cherry, Choke	*Prunus virginiana*
Cherry, Pin	*P. pennsylvanica*
Cinquefoil, Shrubby	*Potentilla frutifcosa*
Elderberry	*Sambucus racemosa*
Honeysuckle	*Lonicera spp.*
Labrador Tea	*Ledum spp.*
Raspberry	*Rubus spp.*
Snowberry, Buckbrush	*Symphoricarpos occidentalis*
Willow	*Salix discolor*

Ornamentals

Lilac	*Syringa vulgaris*
Thyme	*Thymus spp.*

Many of the plants on this list are easy to grow. All are highly attractive to butterflies as a source of nectar.

Caterpillar Food Plants

Alders	Green Comma
Alfalfa	Clouded Sulphur, Orange Sulpher
Aspen	Mourning Cloak, White Admiral
Asters	Pearl Crecent
Bearberry, Kinnikinnick	Brown Elfin
Birch	Mourning Cloak
Blueberry	Pink-edged Sulphur, Spring Azure, Brown Elfin
Cinquefoil	Purplish Copper
Clovers(Trifolium)	Clouded Sulphr, Orang Sulphur
Cow parsnip	Swallowtails
Common nettle	Milbert's Tortoiseshell
Cranberry(Viburnum)	Bog Copper
Dogwoods	Spring Azure
Fescue, other native grasses, sedges	Alberta Arctic, blues Ringlet, Large Wood Nuymph
Forget-me-not	American Painted Lady
Knotweed	Purplish Copper
Lupine	Silvery Blue
Meadowsweet	Spring Azure
Mountain Avens	Alberta Fritillary (in mountains only)
Mustards	Sara Orangetip (in mountains only)
Purple reed grass	Arctic Skipper
Sorrel	Purplish Copper
Thistle	Painted Lady
Violets	Fritillaries
Willows	Swallowtail, White Admiral, Mourning Cloak

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Stokes, D., Stokes, L., and Williams, E. 1991. The Butterfly Book: An Easy Guide to Butterfly Gardening, Identification, and Behaviour. Little, Brown and Company, Toronto. Colour photographs, 96 pages, $12.95

Xerces Society and The Smithsonian Institution. 1990. Butterfly Gardening: Creating Summer Magic in your garden. Sierra Club Books/National Wildlife Federation, San Francisco, CAL. $23.00.

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Preserving the Heritage

Richard Bronstein

Heritage Region in January, Velma Booker of Empress, Alberta has been an enthusiastic supporter.

Mrs. Booker has spent all her life in this small town on the Alberta-Saskatchewan border. She grew up on the family farm, taught school for many years, served as mayor and has always played a leading role in developing tourism as an important part of the Empress economy.

But not at any price and not if it's in conflict with community values, she says.

"We get visitors from all over the world, from England, Australia and New Zealand and we try our best to make them feel welcome," says Mrs. Booker. "But people who come here have to understand the concerns of our ranchers and farmers."

The Empress area has many attractions: the rich flora and fauna of the South Saskatchewan River Valley, the native medicine wheels which dot the prairie landscape, and the buffalo jumps and camp sites which are silent testimony to the thousands of years of human habitation of this remarkable terrain.

But most of it, she points out, is located on privately owned ranch land and that poses potential problems.

This is a region of climatic extremes. Summers can be boiling hot with winds that suck away any trace of moisture. Winter temperatures can fluctuate 50 degrees in a 24 hour period as the Arctic air moves in behind the warming Chinook to snap the life out of plants and animals. This leaves the grasslands in a fragile state. It can't tolerate vehicle tracks and the footprints of busloads of visitors.

Mrs. Booker also worries about preserving the archeology of the region. Although most people act very responsibly, there are some who think it's okay to take a stone from a medicine wheel.

"We don't even touch the stones," says Mrs. Booker.

That's why she and most of the local people prefer that visitors to these ancient sites go with a guide. Mrs. Booker herself often takes individuals and groups and she says others are willing to do the same. The local landowner is consulted and preservation of the site is ensured.

"If people come to Empress and are prepared to accept community sensibilities, they can be richly rewarded," says Mrs. Booker. "We might not be as well organized as the Calgary Visitors Bureau, but we're small enough that if you ask around, you'll get steered in the right direction."

She says that there are a number of seniors in the town who know every nook and cranny in the countryside and they know the history because they've lived it.

The area is rich with artists and craftsmen who would like to show their work to visitors. Many of the area farmers are developing new crops and agricultural practices that are helping to enhance the environment - they are eager to discuss their work with visitors.

And throughout the summer there are numerous recreational activities such as ball tournaments, picnics, rodeos and raft races where everybody lets their hair down and just has fun.

But the real passion in Mrs. Booker's life is the heritage of the Empress region. She has taken it upon herself to steward these treasures for future generations. Treasures like the six-metre long human effigy etched in stone in this endless prairie.

What is the message of these stones? What was the vision, what was the quest that created this unique monument? That's what visitors have to discover for themselves - and they can with the help of Velma Booker and her community.

Author's Address:
19 Chinook Dr. S.W., Calgary, Alberta T2V 2P7.

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The First Official Butterfly Counts in Alberta

[1] *John Acorn and [2] Elizabeth Savoy*

In the United States, it is now commonplace for naturalists to participate in "Fourth of July Butterfly Counts." These counts, which operate much like Christmas Bird Counts, are compiled annually and serve to encourage an interest in the study and appreciation of butterflies. They also provide a source of data on butterfly populations, the interpretation of which is subject to the same sorts of constraints as data arising from bird counts. In the past, the counts were administered by the Xerces Society (an organization devoted to invertebrate conservation) but as of 1993 this task has been transferred to the newly-formed North American Butterfly Association, a group which promotes butterfly watching rather than collecting. Increasingly, the counts are becoming an international phenomenon.

In the Summer of 1993, two such counts were organized in Alberta. One was held on the first of July, at the Helen Schuler Coulee Centre in Lethbridge. It was advertised as the "Canada Day Butterfly Count." The official count circle, centred on the nature centre, has a radius of 7.5 miles. As counts become more popular outside the U.S.A., it is hoped that a more internationally-meaningful name will emerge, and that metric units of measurement will be adopted as well. The senior author has expressed these concerns to the NABA, but for the time being we will measure our circles in miles and rally around the Fourth of July.

The day was warm and sunny, but only five participants showed up: John Acorn (compiler), Adrien Corbiere, Julia Millen, Alice Mulder, and Elizabeth Savoy. Presumably, most people were otherwise committed for Canada Day itself; something we should have anticipated. After all, no one would think of holding a Christmas Bird Count on Christmas Day, now would they? After five hours' search of the area around the nature centre, in mixed grass prairie and riverine cottonwood forests, this small but enthusiastic group had encountered 110 individual butterflies, in 14 species.

The species and numbers reported for the Lethbridge count were: 3 Silver-spotted Skippers *(Epargyreus clarus),* 1 European Skipper *(Thymelicus lineola),* 5 Garita Skipperlings *(Oarisma garita),* 5 Clouded Sulphurs *(Colias philodice),* 19 Cabbage Butterflies *(Pieris rapae),* 4 Western Whites *(Pontia occidentalis),* 2 Melissa Blues *(Lycaeides melissa),* 61 Tawny Crescents *(Phyciodes batesii),* 4 Pearl Crescents *(Phyciodes tharos),* 1 Painted Lady *(Vanessa cardui),* 1 Milbert's Tortoise Shell *(Aglais milberti),* 2 Ringlets *(Coenonympha inornata),* 1 Common Wood Numph *(Cercyonis pegala),* and 1 Dark Wood Nymph *(C. oetus).* Most were identified in the net and released, and all were observed through binoculars. It is hoped that this count will become an annual event.

Another count was recorded on June 26 at the Opal Natural Area, northwest of the town of Opal, which is itself northeast of Edmonton. This count was conducted by participants in a butterfly identification course offered through the Wildbird General Store in Edmonton. The count circle is centred on the town of Opal, and the Natural Area itself consists of aspen and jack pine woodlands as well as shallow marshes and bogs. A warm sunny count day produced 96 individual butterflies in 16 species after five hours of searching on foot. The participants were John Acorn (compiler), Cam Finlay, Joy Finlay, Linda Jarmolicz, Phyllis Lockett, Chi Martin, Laurence Martin, May Ling Martin, Bill Wishart, Pat Wishart, and Cec Yarmoloy.

Butterflies seen through binoculars and a spotting scope and/or captured and subsequently released included: 1 Dreamy Dusky Wing *(Erynnis icelus),* 1 Garita Skipperling *(Oarisma garita),* 2 Long Dashes *(Polites mystic),* 5 Canadian Tiger Swallowtails *(Papilio canadenis),* 2 Mustard Whites *(Pieris napi),* 11 Pink-edged Sulphurs *(Colias interior*--photographs obtained), 3 Western Tailed Blues *(Everes amyntula),* 1 Greenish Blue *(Plebejus saepiolus),* 2 Northern Blues *(Lycaeides argyrognomon),* 3 Meadow Fritillaries *(Boloria bellona),* 1 Silver-bordered Fritillary *(Bolorea selene),* 13 White Admirals *(Liminitis arthemis),* 25 Northern Pearl Crescents *(Phyciodes morpheus),* 4 Atlantis Fritillaries *(Speyeria atlantis),* 9 Ringlets *(Coenonympha inornata),* and 13 Macoun's Arctic *(Oeneis macounii).*

It is hoped that both counts will be repeated on an annual basis. Both were well publicized after the fact, and the results have been encouraging. The day after the Lethbridge count CBC Radio in Calgary interviewed John Acorn for their Eye Opener morning show. Both counts also received newspaper coverage: the Lethbridge Herald carried an article on the count, and Cam and Joy Finlay wrote up the Opal count in their weekly column for the Edmonton Journal. Not long after, the John Janzen Nature Centre in Edmonton offered to serve as the nucleus for an Edmonton count in 1994.

With the recent publication of a guide to butterfly identification in Alberta (Acorn, 1993), it is a simple matter for even inexperienced naturalists to participate in such counts. In both instances reported above, participants were first briefed on the species most likely to be encountered, and shown slides of each. With expected species numbers below 25, identification is usually uncomplicated.

In the States, it is common for Girl Guides and Boy

Scouts to participate in the counts, another fact which emphasizes the potential for participating without specialized knowledge. The more traditional lepidopterological goal of precise subspecific identification of pinned specimens can be set aside for the purpose of these counts, as can the need for collecting voucher specimens, except in particularly vexing situations. It is our sincere hope that more such counts will be organized around the province in the next few years, and that the study of Alberta's butterflies will become increasingly popular within the Alberta Naturalist community.

Literature cited

Acorn, John. 1993. Butterflies of Alberta. Lone Pine Publishing, Edmonton. 143 pp.

Authors' Address:
[1] 15714 - 86 Avenue, Edmonton T5R 4C4.
[2] Helen Schuler Coulee Centre, 910 - 4 Avenue South, Lethbridge T1J 0P6.

Research Project
Wildlife Viewing in Alberta
Volunteers are Needed!

A new wildlife recreation program has been established at the Canadian Forest Service. Program researchers need volunteers to participate in a study on wildlife viewing in Alberta. The purpose of the study is to assess the importance of viewing activities. If you are 18 years of age or older, take trips of 5 kilometers or more from your home for the main purpose of viewing wildlife or wild plants and are willing to keep a detailed diary on your viewing activities over a period of several months to one year then you are eligible to participate. If you are interested in taking part, please complete the information below and return to: **Nontimber Valuation Program, Canadian Forest Service, 5320 - 122 Street, Edmonton, Alberta T6H 3S5. If you would like more information about the project contact Peter Boxall at 435-7272 or Bonnie McFarlane at 435-7383.**

Wildlife Viewing in Alberta

Name: ________________________________

Address: ______________________________
____

Phone: (Days) ___________ **(Evenings)** ___________

Second Annual Snow Goose Festival at Beaverhill Lake, Tofield, AB -- April 23 & 24, 1994

Harry Stelfox

Come and join a flock of thousands to celebrate spring migration at one of the most important migratory bird staging sites in western Canada. This Festival offers two full days of guided bus and foot tours to staging "hotspots". Three types of tours depart from Festival Headquarters in Tofield (50 km east of Edmonton) approximately every hour. Large numbers of snow, white-fronted and Canada geese, sandhill cranes and swans are likely to be seen, along with several types of ducks, shorebirds, hawks and other migrant bird species. Last year over 70 different species of birds were observed, including such rare sightings as a ruff and black-necked stilt. There were also coyote and deer sightings, plus crocuses were blooming in native pasture land and chorus frogs were singing in flooded roadside ditches. Local naturalists and wildlife biologists guide the tours and help participants to see the different types of birds and other wildlife, as well as understand behaviour and the importance of the Beaverhill Lake area in meeting their habitat needs.

The Festival Headquarters in Tofield is also a focal point of activity. A variety of displays, information sessions and fun activities occur throughout both days. Displays are set up by wildlife organizations and natural history clubs, as well as wildlife photographers, artists and crafts people. There will also be a wildlife art show and sale, a birdhouse competition, and environmental education activities for the kids. Food concessions will be available and several display booths will be selling wildlife-related products.

Last year over 3400 Albertans attended the first Festival and more tha 1600 participated in guided tours. It is essential to pre-register to ensure your place on a guided tour. Some of the key viewing sites will be accessible only through guided tours during this weekend. This helps to ensure that the movements of large numbers of people is carefully controlled and that there is minimum disturbance to the birds, other wildlife and local land-owners.

Registration information can be obtained by phoning 496-6950 in Edmonton after March 1. Remember to bring your camera and binoculars and to dress appropriately for the outdoors. Temperatures can be chilly and ground conditions can be wet.

To volunteer, call Jackie Kallal (Town of Tofield) at 662-3269 regarding the Festival Headquarters or Gerry Beyersbergen (Canadian Wildlife Service - Edmonton) at 468-8910 regarding the field tours.

Author's Address:
Fish & Wildlife Service, 9920 - 108 St., Edm., AB T5K 2M4.

Habitat Ecology of the Pileated Woodpecker in Alberta

Rick Bonar

Introduction

The Pileated Woodpecker (PIWO) is a year round resident of forested habitat throughout Canada, with the exception of Newfoundland. This largest of North American woodpeckers is an ecological 'keystone' species because the nest and roost cavities it excavates in trees are needed by other cavity-using forest wildlife. For example, Hayward et al. (1993) noted that 18 of 19 cavities used for nesting by Boreal Owls in an Idaho study were originally excavated by PIWOs. In boreal forests, the constant supply of old PIWO cavities is important because natural cavities are less common, and larger cavity-using species cannot get into holes made by other woodpeckers.

PIWO populations have recovered from the effects of land clearing and uncontrolled hunting in past centuries. A newer concern is forest management, which over long periods tends to reduce the supply of large trees for nesting and wood in various forms for foraging. Logs, stumps, snags, and live trees all contain carpenter ant colonies, which provide the favourite year-round food. In the U.S., the PIWO was designated as a "management indicator species" in many National Forests. In Canada, the PIWO is also getting more attention by forest managers - forest wildlife habitat conservation programs underway in Alberta, Saskatchewan, Manitoba, Quebec, and New Brunswick all put management emphasis on PIWO habitat.

Most of the PIWO life history information we have comes from U.S. forests - there have been no comprehensive studies in Canada. In 1993, a three-year study to meet the need for PIWO habitat ecology information in northern forest ecosystems was started near Hinton under the Foothills Model Forest program. The Foothills Forest is one of 10 Model Forests under the Partners in Sustainable Development of Forests program of Canada's Green Plan. The intent of the Model Forests program is to accelerate the implementation of more sustainable forest management in Canada.

Major funding and support for this research comes from the Canada-Alberta Partnership Agreement in Forestry, Weldwood of Canada Ltd., Foothills Forest, and the Alberta Department of Environmental Protection. In the first year, the Canadian Wildlife Service, the University of Alberta, and many volunteers also contributed support and information. I would also like to thank field assistants Marianne Gibbard and Jody Watson for their help in 1993.

This article describes preliminary results from the first year of the study and plans for the next two years. It is also a request for help in collecting ecological information about the pileated woodpecker in Alberta.

Objectives

The major objective of the study is to compare habitat use between the nesting and winter seasons. The scales being investigated are landscape (what kind of forests are used), stand (what stand types are used), element (what kinds of micro-sites, logs, trees, etc. are used) and sub-element (what locations on trees, etc. are used). The most demanding seasons for PIWOs are expected to be the nesting season, when adults must produce and raise young, and the winter season, when food supplies are limited and birds must cope with winter climate. I also want to compare habitat use between birds with territories in more or less continuous forest cover and those with territories in forests with openings (fields, logging patches, parkland, muskegs, etc.).

Methods

Habitat use is being measured by following individual birds equipped with back-mounted radio transmitter packages and by examining the distinctive foraging sites left by PIWOs. Most of this work is taking place within about 50 km of Hinton. I am also relying on volunteers to find nests throughout the boreal forest area in the western provinces. This information is needed to increase reliability of nest tree and nest site descriptions.

Eighteen confirmed nest trees and three roost trees were located in 1993. Most of these were found by cooperators, and some were known from previous years. We can use information from any year, as long as the tree was a confirmed nest and it can be relocated for measurements. Three adult birds were captured near Hinton and two adult males were fitted with radio transmitters. Data from more than 400 locations of these two birds and 1000 foraging site inspections was collected for analysis.

Territory and Predators

PIWO pairs mate for life and actively defend their territories against other PIWOs throughout the year. In Oregon, territory size was 200 - 1586 ha (Bull and Holthausen 1993). The territory of one adult male near Hinton was more than 500 ha in the summer. Interestingly, this bird regularly crossed the Athabasca River in its daily movements. Individuals may live up to 12 years in the wild but the average life-span is probably much less. The Northern Goshawk seems to be the major predator. Evidence collected at the kill location indicates that goshawks were probably responsible for the death of both adult males we monitored with radio transmitters in 1993. Other raptors such as the Cooper's Hawk, Red-tailed Hawk and Great Horned Owl also take PIWOs.

Food

The major year-round food of the PIWO throughout its range is carpenter ants which are obtained from logs, stumps, and (usually) the base of trees. Particularly in winter, PIWOs excavate large oblong or rectangular holes into sound wood in their quest for carpenter ants and other insect foods. In winter, fresh holes found near the base of stumps and trees are a sure sign that a PIWO has found a carpenter ant colony.

The method used to locate carpenter ant galleries is interesting. After flying to the base of a tree, a PIWO will typically peer about and then softly rattle its tongue rapidly against the trunk. It may then take a couple of experimental whacks with its bill but the bird quickly flies to another nearby tree if nothing is found. Nobody is sure exactly how a PIWO knows a carpenter ant colony is present, but all of the major excavations I have examined so far led to an ant colony. Perhaps the PIWO hears ants moving in response to the tongue-rattling and bill whacking, or maybe it can tell from the sound that hollow areas are present. The wood chips really start to fly when the bird gets down to the business of obtaining a meal. Braced by stiff tail feathers and very strong legs, the bird works with precise, methodical blows to make an opening. It frequently changes position to get a better angle for chiselling off large chips. When it reaches an ant gallery, it slurps up ants with its sticky tongue, which can extend about 9 cm past the end of the bill.

Another winter food is the larvae of various bark beetles, obtained by scaling bark off dead and dying trees using much the same technique employed by Three-toed and Hairy Woodpeckers. PIWOs opportunistically exploit the easily-obtained food available when bark beetle populations increase. This species also eats various berries, obtained by deft picking, often while hanging upside down from wildly-swaying branches. In Alberta, PIWOs have been observed in winter feeding on saskatoon, pin cherry, and mountain ash berries.

In summer, the insect diet is more extensive and includes other ant species, particularly thatching ants, obtained from soft logs and mounds on or near the ground. Pileated Woodpeckers rip into an ant colony, and appear to often concentrate on the ant pupae in preference to the adults. In southern climates, termites are also a favourite food.

We followed the transmitter-equipped birds to gain information about their foraging activity. After locating a bird with a portable radio receiver, we approached close enough to see what the bird was doing but not close enough to disturb it. Direct observations were recorded on field data forms for later transfer to a computerized data base. In summer, our birds foraged on the ground and in trees. On the ground, fairly soft logs and stumps in all kinds of habitats including clear cuts were the foraging sites. Foraging activity in trees was mostly superficial gleaning for insects on the surface. Observations of other birds in the winter suggest that most of the winter food is obtained by deep excavating at the bases of trees, and many of the trees are dry snags.

Nesting Ecology

PIWOs excavate at least one new nest cavity every year and rarely, if ever, reuse old nests. However, they will often excavate a new hole in the same tree used in previous years. Excavation begins in March and several starts may be made and abandoned before the final cavity is finished about six weeks later. Large chips from the hole are scattered about the base of the nest tree on top of the leaves from the previous fall. There will be enough chips to fill about two four-litre ice cream pails on the ground at the nest tree the birds eventually use.

Eggs are laid in late April or early May and hatch after an 18 day incubation. The parents brood the young for the first few weeks and both adults carry food which is fed to the young by regurgitation. When they are about 12 days old, the young birds climb to the nest entrance and the parents feed them from there instead of going inside. By this stage, the young make the typical woodpecker churring sound when the parents are at the nest, and most will fledge within another two weeks or so. Fledged young remain with the parents for most of the summer and leave in August and September. They often do not go far, but many unusual sightings of PIWOs in winter are probably young of the year looking for their own territory.

PIWOs use many different tree species for nesting, but some species and types are clearly preferred over others, and the preference seems to change with forest type. In the forests of Oregon snags of larch, Ponderosa pine, and Douglas fir are preferred (Bull 1987), and the dead tops of living western hemlock are preferred in the rainforest of Washington's Olympic Peninsula (Aubry and Raley 1992). In contrast, 16 of 18 nests located during the first year of this study were in living aspen trees. One was in an aspen snag and one was in a black poplar snag. Nest trees often have interior rot at the cavity location and fruiting bodies (conks) of heart-rot fungus on the trunk. Big trees are needed to contain the large cavities excavated by PIWOs - the diameter of nest trees measured so far ranges from 34-65 cm at chest height.

While searching for nests, we found more than 100 trees with old cavities and similar characteristics to those trees that we know contained nests. Most of these were probably originally used as nest trees, but some may have been excavated and never used and others may have been used as roosts and not as nests. Some stands had many cavities of various ages, indicating that PIWOs may have used them for nesting over a period of many years.

Roosts

Roost trees are an important feature of habitat ecology because PIWOs roost each night in a natural or excavated cavity, which provides protection from predators and poor weather. In Oregon, many roost trees are hollow grand fir trees that have multiple entrances excavated by the birds (Bull et al. 1992), and in Washington biologist Cathy Raley reports that most roost trees are living hollow western red cedar trees with multiple entrances. In Alberta, two of three trees which we confirmed were used as roosts were hollow aspen snags with multiple entrances, and one tree was a living aspen with an interior hollow. We found 15 other trees that fit the hollow tree description, including one aspen snag with 13 entrances!

Nest Treasure Hunt

In an effort to recruit and encourage volunteer help, we are sponsoring a March 1 to May 31 treasure hunt to locate nests within 50 km of Hinton, except in Jasper National Park. We will provide a search package with maps and instructions to any volunteers who want to search for nests, and we can even supply copies of air photos and directions to promising areas (recent PIWO sightings or foraging signs) for those who are serious about looking. Finally, we are offering a reward of $200 for any new active nest located within the treasure hunt area. If you are looking for something different to do on a spring weekend, and the chance to earn a reward, come to Hinton and look for PIWO nests! Access is generally good and much of the snow in the Athabasca River valley is usually melted by March. If the 1994 treasure hunt is successful, it will be repeated in 1995.

The treasure hunt is intended to find nests where we can capture birds for the telemetry program, but we are also hoping to find and measure as many nests as possible throughout Alberta in the next two years. We can not offer a cash reward for this, but we will give to the first 100 people who report a confirmed nest a limited edition print from an original watercolour painting by wildlife artist Norma Bonar. We are asking for information from any person who knows of a nest from previous years (and can relocate it!), and any nest located in 1994 or 1995. A free package that tells what to look for and information about the Hinton treasure hunt can be obtained by contacting myself or Marianne Gibbard at 865-8193 (call collect during business hours). Our mailing address is Foothills Forest, Box 6330, Hinton, T7V 1X6 or Fax 865-8164. In the Sherwood Park area, contact Kim Allan at the Alberta Bird Rescue Association, Phone 922-6103. Besides nest information, Kim is also interested in any PIWO sightings or other information from Strathcona County.

Pileated Woodpecker at nest. Photo: Hardy Pletz

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The Canid Equation

Dick Dekker

Before settlement, the prairies were home to wolf and swift fox. Today, the coyote is numerous, leaving little room for foxes.

In the golden light of the afternoon sun, five flame-coloured puppies frolic near their den, cavorting in a fluid game of tag or wrestling with each other in a huddle, white-tipped tails flashing. Their playful antics bring a smile to the face of the naturalist sitting quietly by the fence some distance away and watching through binoculars. Until the charming scene comes to a sudden end.... A blur of brown fury streaks out of the bushes and bounds up the sloping field. Coyote! A hidden fox barks a hoarse alarm. The puppies scramble and scatter into the safety of underground burrows... in the nick of time.

What would have happened if the vixen had not been so alert? A week later, when I visited the site again, the den was deserted. By one of the entrances lay the tail of a pup, cut off at the base.

During thirty years of observation in central Alberta, I saw several other hostile interactions between red foxes and coyotes. Competition for space and food is a fact of life between all wild creatures, big and small, but especially among the *Canidae*. They are embroiled in a running feud that can have lethal consequences for the smaller species.

If chased by coyotes, foxes proved to be fast and agile, escaping quite easily it seemed. But both adults and pups were at risk near dens. The parents tried to lead intruders away by following closely and drawing attention to themselves, barking all the time. In their urge to get away from their aggressive cousin, Alberta foxes avoided areas where coyotes were numerous. By and large, rural foxes selected den sites near human habitation, around farms and along roads, hiding their young under barns or in culverts (Dekker 1983).

In the same way, I discovered spatial segregation of foxes and coyotes in the mountains of Jasper National Park. While coyotes dominated the valley bottoms, foxes stayed mostly on the slopes, especially near steep terrain. Foxes climb well, and by virtue of their light body weight and relatively large feet, they can stay up on snowdrifts where coyotes flounder. Over three decades, I negatively correlated sightings of foxes with coyote presence. In turn, numbers of the latter were dependent upon the presence of wolves. If there were few wolves, I saw many coyotes and little sign of foxes. If wolves were common, there were few coyotes and more foxes (Dekker 1989).

The wolf's loss is the coyote's gain

The ancient enmity between members of the *Canidae* can be sparked by competition for food. One winterday, while I was watching from a hill side in Jasper Park, three wolves burst out of the forest, surprising a coyote that had been audacious enough to feed on the pack's kill. Bounding across the frozen Snake Indian River with enormous leaps, one of the wolves was no more than three body lengths behind the coyote when it entered the woods on the other side. Presently, the wolves returned, but I never found out what happened to the coyote. The remains of wolf-killed coyotes have been found on numerous occasions by researchers, in Jasper as well as in other western National Parks. Wolves seldom eat their canid victims.

High population densities of wolves continue to exclude coyotes from some northern regions. After the wolf's arrival on insular Isle Royale National Park in Lake Superior, resident coyotes were extirpated. In other parks where wolves are common, such as Jasper and Riding Mountain, wolves are unable to wipe out their smaller kin because of ingress from surrounding regions.

Originally, "el soprano" as some Mexicans call him, seems to have been an animal of arid regions in the southwest. It was largely, perhaps even totally, absent from Canada during the time when the prairies teemed with bison and wolves, before the arrival of the Europeans. In 1757, Anthony Henday, the first Hudson's Bay fur scout to

Captive-raised swift fox. After release, will it manage to avoid cousin coyote? Photo: Dick Russell

reach Alberta, wrote that it was difficult to tell which were more numerous, wolves or bison. He also reported "little grey foxes" as far north as central Saskatchewan. But his narrative does not contain any references to the coyote. Nor is this species described in the diaries of that other great early naturalist, David Thompson, who spent many years in the foothills and mountains of Alberta. It is very unlikely that an animal like the coyote would have escaped Thompson's notice, since he accurately describes the other wild dogs, including their colour phases. Moreover, the earliest fur records for Alberta include the skins of wolf, red fox and swift fox, but not coyote.

Why then are there so many in Alberta today? They arrived after the great changes that took place in the wake of the white man's arrival. During the 1800s, the large mammal system in the mountains and on the plains collapsed as a result of over-hunting. Following the decimation of their ungulate prey species, coupled with severe persecution, wolves became extremely scarce. In the absence of their arch enemy, coyotes spread to the north and east across the continent, from Alaska to the Maritimes. Very recently, they even managed to cross sea ice to Newfoundland, completing the greatest land-grab of any predator in North America.

The red fox conquers the world

In its own way, sneaky and prolific, the red fox has managed to expand its range too, despite every form of control. In Europe, the demise of larger predators, particularly the lynx, was the fox's gain. Common on four continents, it is now the most widely distributed carnivore on the globe. Adaptable enough to prosper under the very nose of mankind, Reynard even flaunts his luxurious brush in cities and towns, wherever he finds a few acres of rough ground to make a living and to hide a den from enemies such as the coyote.

Yet, foxes continue to thrive in northern wilderness, coexisting with cousin wolf by virtue of their differences. Given the chance, wolves kill red foxes, but the two species have lived side by side for millions of years. Wolf and fox tolerate each other since their habitat and food requirements are quite far apart; whereas wolf and coyote, or coyote and fox, are too close for comfort, so to speak.

Originally, the red fox was not an animal of the Alberta plains (Soper 1964), which were the domain of wolves and swift foxes. The red fox felt more at home in brushy habitats and semi-open woodlands, all the way north to the tundra. For a variety of reasons, it was also scarce in the parklands of central Alberta, but during the 1960s it quite suddenly made a strong come-back (Dekker 1973). Its return coincided with a drop in coyote numbers. Paradoxically, it happened during the dawn of a new era of tolerance for predators when the routine use of poison baits was beginning to be questioned and abandoned. But at about the same time, country people obtained an exciting new toy that allowed a selective method of coyote control: direct pursuit with snowmobiles. Also during the 1960s, while fur prices were high, country people revived the ancient sport of coursing packs of greyhounds.

Before hunting with snowmobiles and dogs were outlawed, the coyote population received quite a beating. As I see it, the resulting scarcity of its ancient enemy gave the red fox its chance to recolonize central Alberta. In the meantime, since the 1980s, coyotes seem to have regained all the ground they once lost. Several former fox territories near Tofield and Leduc have been abandoned and all I see and hear there now are coyotes.

Return of the native: the swift fox

The territorial gains made by red fox and coyote, achieved under their own steam, are in sharp contrast to the losses suffered by the smallest member of the canid family, the swift fox. Its former range, that once stretched from California well into Canada, has shrunk. The reasons for its disappearance from the plains of Alberta and Saskatchewan are several, including the ploughing up of prairie sod and the wide-spread use of poison to control predators and rodents (Herrero 1984). But in my opinion, the little fox's disappearance may well have been tied to the proliferation of its aggressive and ubiquitous cousin, the coyote (Dekker 1991).

At any rate, the canid equation on Alberta's plains has become even more interesting with the current efforts to reintroduce swift foxes. Initiated by Stephen Herrero of the University of Calgary, who has been working on the idea since 1979, a multi-agency Recovery Team was set up in 1983. The program subsequently became the flag ship of the imaginative campaign "Prairie For Tomorrow" underwritten by World Wildlife Fund Canada.

From a human perspective, the sentiments behind the swift fox releases were noble. Writes Herrero: "If we can learn to share the prairie with (the) swift fox again, maybe it will give us a small measure of hope that we can peacefully share the earth with each other."

But were these sentiments supported by a realistic assessment of the canid equation? To its consternation, the Recovery Team soon found out that most of its captive-raised foxes, released with great care, ended up as "coyote-fodder."

The reintroduction of swift foxes has not lacked for public support and dogged determination on the part of its advocates. Success was long in coming and attained only quite recently: as many as 150-250 swifties are alive today and producing pups on their own! This break-through was largely due to a switch from captive-raised stock to wild-caught animals (Carbyn 1993). Live-trapped in Wyoming and transported to Alberta, these prairie-smart critters proved to have the skills to avoid their aggressive cousin.

In their native Wyoming, the two species share the open range, but coyote densities, compared to Alberta, may be less. This matter should be investigated.

As fox biologist David Henry explained, swift foxes can cope with their predators by choosing den sites on short-grass plains, away from possible ambush sites such as wooded ravines. In open terrain, foxes have a good chance of spotting enemies from afar, giving them time to escape or dash underground at a flash of their black-tipped tail. Essential for safety is therefore a good selection of dens and badger burrows. In essence, survival for the swift fox depends on the same kind of strategy as for the red fox: to minimize the risk posed by coyotes, especially during pup-raising time.

Coyote control

The cardinal question regarding the future of the swift fox is a fascinating one: Once additional releases stop, will the little underdog manage to cope with its mortal enemy? This question can only be tested after the program is halted. In view of the reported progress, and assuming that the swift fox is a worthy member of the adaptable canid clan, shouldn't it be able to manage its own affairs by now?

By way of comparison, in the absence of other large predators, the introduction of red foxes into western Holland did not need much prodding. The illegal release of just a few pups in coastal dunes took off like fireworks. The use of traps had recently been outlawed and shooting had been curtailed. After a few years, foxes were extremely abundant, creating havoc in bird sanctuaries. Hares became very scarce. And to everyone's surprise, ermine and ferrets became locally extinct (Mulder 1990).

In this age of tolerance for all creatures big and small, coyote densities on Alberta's plains can be very high too, especially in agricultural regions where farmers dump the carcasses of cattle in the open, involuntarily helping scavengers to survive lean times. Coyote depredation is perhaps the key to the scarcity of prairie long-tailed weasels (Dekker 1993), quite apart from the pressures facing red and swift foxes.

The option of coyote control by government agents has been the subject of debate among members of the Recovery Team. "We decided against it," said Steve Brechtel, Alberta's Manager of Endangered Species. American biologists involved in the reintroduction of black-footed ferrets, another species for which the prairie has become too hazardous, are apparently not so timid. Coyote control is part of a current program to release captive-bred ferrets into Wyoming. Incidentally, it is quite likely that local land-owners in southern Alberta, who have the right to shoot and trap coyotes at any time, are doing some control of their own to aid the little underdog.

Although it would be interesting to know how much money has been spent on the swift fox releases and how many were set free thusfar, such data have not been made public. It is known, however, that the expensive campaign has been in operation for 11 years. Despite the rather large numbers of swift foxes alive today, David Henry (1993) stated: "It is still a fragile population." And Ludwig Carbyn of the Canadian Wildlife Service wrote: "It is not certain whether the species can survive over longer periods if drastic short-term environmental changes such as droughts, severe winters or long-term climatic change should occur."

According to Steve Brechtel, Canadian agencies will continue to fund the swift fox releases at least another five years. The aim is to establish one or two other populations. Planned releases in Grasslands National Park are particularly pleasing to naturalists, especially those who have worked so hard to make this unique prairie park a reality. From a conservation perspective, no better place could be found for the native's return than this scenic ecosystem where even the "prairie dog" has managed to hang on, whistling its predator alarm at a host of enemies, including that wily interloper: the coyote.

Agencies and individuals involved in the swift fox program deserve a round of applause for effort. In the final analysis, however, how their pampered pet will cope with the canid equation remains an interesting story that can only unfold naturally after all releases have stopped.

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Book Reviews

Which Deer is That? - *Hoofed Mammals of Alberta*

Have you ever wondered where you can find caribou? How elk communicate? How many days a hunter must spend before he or she can expect to harvest a moose? Or how much energy a bighorn sheep must consume each day to survive the winter? If so then Hoofed Mammals of Alberta is the book for you. This well-illustrated book, edited by Dr. J. Brad Stelfox of the Alberta Environment Centre, is a compilation of the work of 18 well-known experts in the fields of ungulate biology, management and use.

This 250 page book is the result of more than five years of assembling data and writing. It is formatted for easy access to an immense variety of information, including over 175 pictures, maps, tables and charts. Topics covered include identification, distribution, communication, hunting, economics, population status, management, disease and parasites, and game farming.

Published by Lone Pine Press of Edmonton, the book will appeal to a diverse readership, serving as a text for university and college students, reference manual for wildlife managers, and source of valuable information to conservationists and the hunting community. If you want to read about the controversy surrounding game farming, to understand why moose lose their hair in the middle of the winter, to discover where the best viewing locations for hoofed mammals in Alberta are, and more, this book provides insight in a clearly written, well-illustrated format.

Book development and publication were sponsored by the Alberta Environmental Centre and Fish and Wildlife Services of Alberta Environmental Protection; Alberta Environmental Research Trust; Recreation, Parks and Wildlife Foundation; and Alberta-Pacific Forest Industries Inc. Those interested in acquiring copies of the book at the affordable price of $19.95, should direct their inquiries to Lone Pine Press at 433-9333.

***Contact:** Dr. J. Brad Stelfox, Alberta Environmental Centre, Environmental Protection, (403) 632-8211, Fax: (403) 632-8379.*

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Atlas of Breeding Birds of the Maritime Provinces

Anthony J. Erskine, Co-published by Nimbus Publishing Ltd. and the Nova Scotia Museum x+270 pages.
Price $29.95.

For those of us who were involved in the Alberta Breeding Bird Atlas project, this Atlas of the Maritime Provinces provides a profound sense of deja vu. Both projects followed the model of the successful Ontario Breeding Bird Atlas Project and both had major logistic challenges. The field effort in the Maritimes involved more than 1100 atlassers contributing over 43,000 volunteer hours from 1986-90.

The book is arranged in nine chapters with a set of appendices including overlay maps on land use, forest cover, party hours and population distribution in the three provinces. The first three chapters are introductory (Chapter 1); a review of the physical geography, topography, climate, and land use of the Maritimes (Chapter 2); and the historical changes in distribution and abundance of birds in the region (Chapter 3). In comparison to Alberta, it is interesting to consider European presence in the region since roughly 1600 AD and that today, virtually every grid square was accessible by road. Clearing of deciduous forests for agriculture, draining of wetland, and urbanization have created the biggest changes in Maritime landscapes.

Chapter 4 is an executive summary of atlas results featuring tidbits like: the most species detected in a square (134--Antigonish and Grand Manaan) and the amazing 107 confirmed breeders out of 115 species detected for the Kingston square. Chapter 5 provides direction on interpreting the range maps and species accounts. Chapter 6 is the heart of the atlas with 214 species accounts and range maps. Each species receives a single page (except for peripheral or casual species which get a half-page) consisting of a (generally) good quality half-tone drawing, a 1/2 page two-colour map, and a 1/2 page of text. The text discusses habitat preferences but focuses on distribution patterns, anomalies, and historic changes. Tony Erskine's writing and editing create a consistent style throughout and the accounts are enjoyable to read.

The range maps provide two looks at distributions, first with each 10km x 10km square mapped; secondly as an inset map with breeding status marked for 20km x 20km squares (which equals four 10km x 10km squares). A legend gives estimates of the number of breeding pairs in each province and the phenology of the breeding season based on data from Maritimes Nest Record Scheme cards. Significant references documenting observations in the species accounts are noted in the accounts and listed in a separate bibliography.

The level of breeding evidence for each species is indicated on the maps by varying the size of a red circle centred on each square. Ironically, the success of the Project in covering so much of the Maritimes creates, for me at least, problems in assessing the maps. I find the amounts of red overwhelming. If a species is sparsely distributed, the relative size of the dots is easier to see and the maps more pleasing to examine.

Chapters 7 through 10 provide context for interpretation of atlas data, particularly zoogeographic patterns, the validity of abundance estimates, and the need for conservation action. A useful set of appendices is included offering an overview of the project management, details on year-to-year results, and a statistical presentation on the process of estimating population sizes.

The Atlas of Breeding Birds of the Maritime Provinces is a different style of book than the Atlas of Breeding Birds of Alberta. It is a soft cover volume, does not include colour photos and probably would not appeal to a casual birder. On the other hand, it provides a thorough treatment of the distribution and status of Maritime birds. It gives more quantitative information in tabular or graphic form, as well as more analyses of the data than does our atlas. Neither book is a field-guide but both are indispensable resources for birders.

I have only minor quibbles with this book including, I suppose, a debate with the atlas committee about the value of collecting abundance data. Overall though, it is an excellent product and a testimony to the many thousands of hours required of volunteers to build the database. I would advise anyone who is contemplating a trip to the Maritimes, to look for birds, to get a copy.

W. Bruce McGillivray

Field Trips - FAN Meeting at Calgary, Jan. 30/94

Owling West of Calgary - 7:00 am.

Jean and Rodger Dunn took visitors birding on Sunday, primarily owling. We met at a time which deterred a few prospects; but our group numbered six.

Driving to Sibbald Creek Trial, we went south into Kananaskis Country, for a chance to see a Pygmy Owl, which Rodger knew to be in the area. As it was getting light between 8-9 am, it was heard faintly. As the trail deteriorated into knee-high snow, we were encouraged by the occasional "hoo".

The "Pygmy" was located in the top of a tree on a ridge. With this opportunity, no one needed more encouragement to all arrive at the base of the owl's tree. With telescope and binoculars, we watched for about 20 minutes. In spite of our talking and laughing it seemed quite unmoved and was still sitting on its perch when we left. This was a "first" for three of us, and the "eyes on back of head" was a unique and revealing identity.

Next objective was a Hawk owl, seen several times in a small area south of Bragg Creek; but this proved more elusive and was not found, nor were the woodpeckers that were anticipated. While driving we did see four Rough-legged hawks on poles, Snow Buntings, Redpolls and a Shrike, which added to the day.

Thanks to Jean and Rodger; anyone who can guarantee a Pygmy owl is indeed an expert birder!

Dick Clayton

Bow River - 9:00 am.

Saturday night's snowfall added a freshness to our stroll along the Bow River in Calgary. We were introduced to an easily accessible and rewarding birding site, by Andew Slater, where waterfowl are reported during winter months. We saw numbers of Mallards and Canada Geese gathered in the open water, and also observed some Common Goldeneye, Gadwall, Bufflehead and a female Green Winged Teal. Most inspirational was the dipping and diving of a rusty headed female Merganser that darted about with what seemed to be great enthusiasm. With the sun peaking through the clouds and skeletal branches of the trees, we were lucky to see a Great Horned Owl. Owls on our minds we headed east out of Calgary and sighted a Snowy Owl which flew into the ditch and spent the next few minutes peering at us over its newly acquired prey.

Ruth M. Powell

Inglewood Wildlands & Petro-Can. Refinery Site - 2:00 pm.

Two of us and several local residents met with Catherine Bertrand who is Caretaker and works in the Park; so she is very well versed in its progress.

There is a long range plan to take this from a contaminated site to a park and join it to Inglewood Bird Sanctuary. It is now fenced and closed to the public. Volunteers are helping with tree planting and other projects. Petro-Canada is still responsible and involved, and although it will take a few years to mature, the prospects and potential are encouraging.

It is now an open grassland, with some contouring, so the wildlife is limited. We saw eight partridge, mallards from Inglewood and numerous tracks, especially coyote. Walking around the site we saw small bush and tree plantings, with contour for a lake.

Now that the basics are in place, we wish Catherine well and look forward to seeing the results in a few years.

Dick Clayton

Salmon Arm Nature Camp

Sunday, June 4 - Friday, June 20, 1994

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The Alberta Naturalist is published March 1, June 1, September 1, and December 1. The deadline for contributions is 6 weeks prior to the publication date.

1. Manuscripts must be typed, double spaced on 81/2" by 11" paper, or submitted on diskette (IBM compatible). Mail: FAN, Box 1472, Edm., AB T5J 2N5. Express: 11759 - Groat Rd., Edm., AB T6M 3K6. Fax: 453-8553. Phone: 453-8629.

2. One or more photos, illustrations, or slides should accompany your article. Also include captions and credits.

3. High quality maps and short tables are welcome.

4. Footnotes and a bibliography should include author, title, place of publication, publisher, date, and page reference or pages.

5. Manuscripts should contain a minimum of scientific jargon; they should be understandable by the general public.

6. Site locations should be described in reference to communities on the Alberta Road Map.

7. Articles not previously published are preferred.

8. The editor reserves the right to edit for length, grammar, accepted nomenclature, and readability.

9. Manuscripts may be sent out for peer review.

10. All articles must be accompanied by the author's address.

SPECIFIC GUIDELINES

1. Letters to the Editor:
   - up to 500 words

2. Comment Column:
   - up to 500 words
   - should be topical; may include personal observations or reactions to an article in the AN, a current issue, government or private action, FAN, policy, etc.

*3. Issues Column:
   - 1000 to 2000 words
   - current issue, preferably in Alberta
   - query editor in advance

*4. Feature Articles:
   - 1000 to 2000 words
   - may deal with personal observation of natural phenomena, report on a trip, profile of a facility, park, area, or activity, concerns of membership, etc.

*5. Research/Report Articles:
   - up to 2000 words
   - should include where research was undertaken, purpose, sponsor, research methodology, and summary of findings with emphasis on the latter

6. Technical Articles:
   - 500 to 1000 words
   - "how to" articles of interest to naturalists
   - could include identification, photography, minimum impact "naturalizing", etc.

7. General News:
   - 100 to 300 words
   - interesting personal observations, unusual sightings, upcoming events not sponsored by member clubs, etc.

*8. Profile Articles:
   - 1000 to 2000 words
   - profiles of notable Alberta naturalists

9. Club News:
   - 500 to 750 words

10. Book Reviews:
    - 500 to 750 words
    - must include publication data, price, short synopsis of the book, strengths and weaknesses

11. Conference Review:
    - 500 to 750 words
    - must be published within six months of the event

*Exceptions to these guidelines may be made in consultation with the editor.

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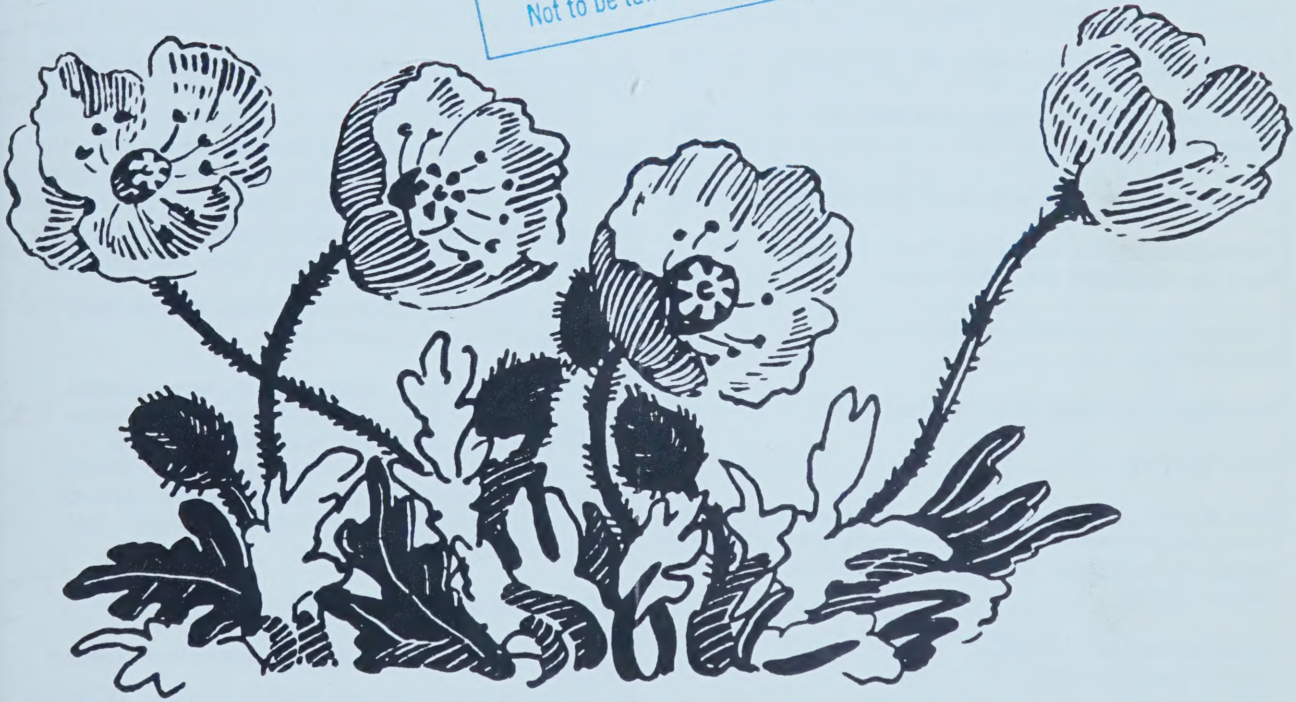

Alpine Poppy
(Papaver pygmaeum)

The One Percent Naturalist - The Whaleback - Livingstone Controversy - Little Fish Lake Records
Mountain Bluebird Trails - Stewardship '94 - Does Canada Need an Endangered Species Law? - Purple Loosestrife
Long-tailed Weasels - Lake Louise Summer Friends - FAN Field Trips - What Was That?

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CONTENTS

President's Page 21

Editor's Page 22

The One Percent Naturalist 23

The Whaleback - Livingstone Controversy 24

Records of Harlequin Duck and Sabine's Gull at Little Fish Lake, D.B. (Tim) Schowalter 26

Duncan Mackintosh Winner of the Loran L. Goulden Memorial Award in 1994, David Ealey 27

Mountain Bluebird Trails Conservation Group. 1993. Fourteenth Annual Report, D.J. Mackintosh 28

Conference Report on "Stewardship '94", Don Stiles 29

Does Canada Need an Endangered Species Law?, Stewart Elgie and Chuck Dauphine 30

Purple Loosestrife: What Is the Story?, Patsy Cotterill 32

Why Do Long-tailed Weasels Climb Trees? And Why Have They Become So Rare?, Dick Dekker 35

"Summer Friends" at Lake Louise Ski Area, Margaret Walker 36

FAN Field Trips, Pauline Le Bel and Dave Ealey 38

What Was That? 40

Book Review 41

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Deadlines for FAN project reports are: Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, Curtis Pollock, Box 776, 100 Mile House, B.C. V0K 2E0.
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forest Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Honorary Member: Professor W. Ray Salt

Patron: Hon. Dr. J.W. Grant MacEwan

The Federaton of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or orther features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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President's Page

Harvey Gardner

Glancing through the spring '93 issue of the *Alberta Naturalist* I see Barry Jenkins starting with Special Places 2000, so I'll start there too. The Federation of Alberta Naturalists (FAN), the Alberta Wilderness Association (AWA) and the Canadian Parks and Wilderness Society (CPAWS) are working together and have hired Maggie Ellen as Start-up Project Co-ordinator under independent contractor agreement. The World Wildlife Fund has expressed a desire to enter Alberta and start a similar project, so we hope that they can be persuaded to work with us rather than run a parallel operation at greater expense.

I have attended two meetings of the Eastern Slopes Energy and Environment Committee (ESEEC) made up of FAN, AWA, CPAWS, the Rocky Mountain Ecosystem (RME) Coalition, Sierra Club, several petroleum companies and the Canadian Association of Petroleum Producers (CAPP). At one meeting a letter to the provincial government was thrashed out supporting Special Places 2000. At the next meeting it was revealed that on meeting with their directors both the RME Coalition and CAPP had decided not to sign the letter. An assertion was made that some petroleum companies are supporting Special Places 2000 in public yet allowing other employees to pressure the Minister of Energy to quash the initiative. Many folks have various misconceptions and some hostility toward protecting "any more" areas.

Edgar T. Jones wrote an article in the *Alberta Naturalist* regarding decline in passerine numbers in the Edmonton/Beaverhill area. Information came to me recently from a former oil-rig worker that there has also been a drastic reduction in songbirds in the Swan Hills. If anyone has information on that area it could/would be relevant. Please contact me.

FEESA, Environmental Education Society, (a group of educators), has kindly asked me to do a brief talk and tour on July 24th, regarding sustainable ranching. I'm looking forward to "teaching teachers" during their 12 day tour of Alberta.

On our ranch we have just embarked on a range improvement project with co-operation from the Alberta Land and Forest Service and Alberta Fish and Wildlife. An encroachment of willow and other brushy species on former hayland is not only messing up grazing, but also reducing the Sharptail Grouse population locally. We have arranged for a shepherd to bring in a large flock of sheep to assist with this problem. My family and I hope to make a presentation involving the shepherd, both government agencies and ourselves, emphasizing co-operation and the interrelationships between agriculture and "the environment". Many goals, after all, are shared. Thank you.

The 1994 Emerald Awards

Each year the Alberta Foundation for Environmental Excellence presents the Emerald Awards to recognize Albertans who are taking positive action to help the environment. Last year FAN was the recipient of an Emerald. This year, Michael O'Brien was awarded an Emerald for his long-time efforts on behalf of the Red Deer Naturalists. Among other achievements, Michael persuaded Union Carbide to create the Ellis Bird Farm, a sanctuary for Mountain Bluebirds. Other Emerald recipients this year were the City of Edmonton, Edmonton alderman Tooker Gomberg, Access Network, Envirocycle Expediting (Edmonton), DBS Environmental (Lethbridge) and Alberta Power Ltd. (Jasper). The award winners were selected from a field of 138 nominations from across the province.

Editor's Page

From the Editor:

Although I've been a city dweller much of my life I was fortunate to spend several of my early years half a block from the forests of the University of British Columbia Endowment Lands in Vancouver. At the bottom of my street by the woods was a storm sewer outfall and little pond, a perfect place for collecting tadpoles and watching pond life. My favourite position was belly down, chin in mud, so I could see into the pond and be eye-to-eye with the water striders. Lord knows what they saw.

My mother and I also used to make forays down to the beach to look for clams, starfish and other sea life. Each new specimen was put in a bottle with formaldehyde, labelled and put on the back porch for posterity. (My mother was a biologist). I wouldn't do that now (nor would my mother), but as a child I found those bottled creatures -- and the living ones -- ceaselessly fascinating.

These experiences and others had their effect: I went on to do a degree in Environmental Studies at York University. Since finishing school I've had stints in land use planning, environmental education, administering an environmental group, and in research, writing and editing. I was involved in the research and initial writing stages of the Alberta Bird Atlas.

My name is Edrea Daniel and in May I was appointed new editor of the *AN*. I hope to carry on the tradition of hardworking and dedicated editors who have come before me. Many thanks go to Jane Livingston for her good work as editor this last year.

There are a few changes I would like to make with the *AN* that I hope will interest you. I would like to introduce an "issues" page -- to help keep people updated and informed on provincial issues important to the naturalist community. I also would like to print articles from a national perspective that are pertinent to Alberta -- such as those in this issue by Stewart Elgie and Chuck Dauphine on the proposal for a federal endangered species act. Trevor Goward's article is a thought-provoking piece we all should consider. How many of us are 100 percent naturalists? In this vein I hope to have guest editorials at least twice a year, editorials to help us contemplate issues and our roles in supporting Alberta's natural community. As naturalists we are aware of the great beauty of our world, and its fragility. How are we to be protectors of that beauty?

I welcome your comments on the *AN* and encourage you to keep sending articles. The success and quality of the magazine depend to a large degree on you interest and contributions.

R. Edrea Daniel

To the Editor:

This is an open letter to all those interested in Canadian conservation and research. Having been a bat enthusiast for several years, I have become keenly familiar with most of Manitoba's bats and their habitats. It is for this reason that I am establishing the **Bat Society of Manitoba.**

The intent of forming the society is to promote public information, education, and knowledge regarding Manitoba's bats. Possible locations, breeding habits, migration patterns, food intake and general observations will be compiled and made available for studies or simply for general interest. Bat Conservation International of Austin, Texas provides a wealth of information on North American bats. However, information on Canada's bats is limited. It is not the intent of the Society to overtake Bat Conservation International (B.C.I.), but rather to become a Canadian affiliate. The Bat Society of Manitoba intends to use a similar approach to that of B.C.I. but with a Canadian emphasis.

The Bat Society of Manitoba's goals include: to foster awareness, respect and appreciation for Canadian bats through education and information; to liaise with Bat Conservation International and other bat societies worldwide; and to develop understanding of Canadian bat populations and patterns.

Members will be provided with quarterly newsletters which will be compiled using articles submitted by members or other sources. The aim of the Society is to utilize past and recent reports and studies to promote and protect bats and their habitats. Anyone willing to submit reports, studies or articles and/or to become a member, please contact the Bat Society of Manitoba, 200 Havelock Avenue, Winnipeg, Manitoba, R2M 1H9. Membership fees are $10/year and payable to the Bat Society of Manitoba. For more information please contact Ric Nash at (204) 253-0454.

Sincerely,
Ric Nash

The One Percent Naturalist

Trevor Goward

It is said that the Duke of Cumberland once complimented the British playwright Samuel Foote with the following bouquet: "Mr. Foote, I swallow all the good things you say."

"Indeed, sir," replied Mr. Foote, "then Your Royal Highness has an excellent digestion, for you never bring any of it up again."

Recently I found myself lodging a similar complaint with the readers of "The Enlichenment," a column I write from time to time in the *B.C. Naturalist.* After nearly a decade of writing into what had often seemed a vacuum, the time had come to ask: Was anybody listening? Had anybody heard me say, yes or no, that naturalists ought to pay closer attention to the little things of this world?

Over the years I had repeated this admonition, in various guises, more times than a birdwatcher has sunflower seeds. Yet for all that, the B.C. naturalist community seems to me no more "enlichened" in 1994 than it was in 1984, when my column premiered.

This impression was confirmed by a thumb-through of back issues of the *B.C. Naturalist.* Tokenism aside, the same old themes cropped up issue after issue, year after year: birds, wildflowers, birds, wetlands, birds, weeds, birds, whales, and birds, birds, birds.

While our naturalist preoccupations seem to have changed little over the past decade, Canadian societal values have changed rather a lot. Somehow, for example, old-growth forests aren't quite as decadent as they used to be. Nor are varmints, on the whole, quite as varminty.

Even the sacred term "wildlife" now officially encompasses not only the 1 percent of animals you can eat, but also the 99 percent of plants and animals (including wolf spiders, slime molds, liverworts and, of course, lichens) utterly unworthy of the privilege. Will the meek finally inherit the earth? I doubt it, but at least it's encouraging to see them invited to the reading of the will.

Given this impressive broadening of conservation mandates, one wonders why naturalists haven't similarly broadened their knowledge mandates. By definition, naturalists are -- or ought to be -- caring knowers. But where are the caring knowers of wolf spiders and ladybugs, of slime molds and lichen crusts, of liverworts and freshwater algae? Where are the local experts on bracket fungi and pondweeds, on molluscs and geometrid moths? The answer is simple: they're out watching birds.

I hope I may be forgiven for pointing out that birdwatching, for all its merits, is something of a mixed blessing. For though the watching of feathered lizards has recruited tens of thousands into the naturalist fold, it has also continuously distracted attention from other living things perhaps more in need of being watched. On balance, we are certainly better off with birdwatchers than without them. But even Roger Tory Peterson would (and does) admit there are other things to study.

Perhaps it comes down to this: naturalists, no less than the rest of humanity, are addicted to the obvious and the flashy. As in the shopping mall, so in the forest. Demonstrate this to yourself by checking off in your mind the number of songbirds you can identify. Now repeat the same exercise for lichens. I rest my case.

Do we actually believe, as the binoculars dangling from our necks would seem to suggest, that songbirds are somehow more "real" than lichens? I hope not. Value judgements of this sort are not only sheer biological illiteracy, they are unbecoming of naturalists. Better to recognize that everything living has descended from a long and remarkable tradition of close calls and epic escapes. Better to admit that life at whatever scale is a miracle worthy of attention.

If there is opportunity in the present declining state of world affairs, surely it is, as David Suzuki has pointed out, to reorient our personal and social priorities to greater balance with the natural world that supports us. Achieving this balance, however, will require new and deeper allegiances to all living things, not just the obvious and flashy.

In 1994, it is no longer enough for 99 percent of Canada's naturalists to focus on one percent of this country's biodiversity. There is simply too much at stake. Given society's admittedly periodic, but ultimately growing concern for the maintenance of biodiversity, the time has come for us to accept the one role it is given to naturalists alone to play: to monitor, in full living detail, the well being of the forests, fields, rivers and lakes around us.

Goodbye, one percent naturalist. Hello, 100 percent naturalist.

Author's Address:
Box 131, Clearwater, B.C. V0E 1N0.

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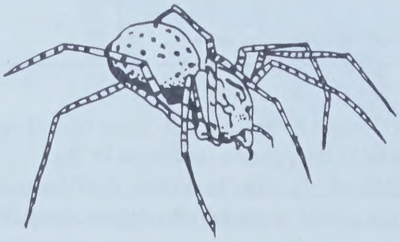


The Whaleback - Livingstone Controversy

The Whaleback-Livingstone area is located about 120 km south of Calgary, west of Highway #22, at the foot of the Rocky Mountains. It is the largest relatively undisturbed representative of the montane subregion in Canada.

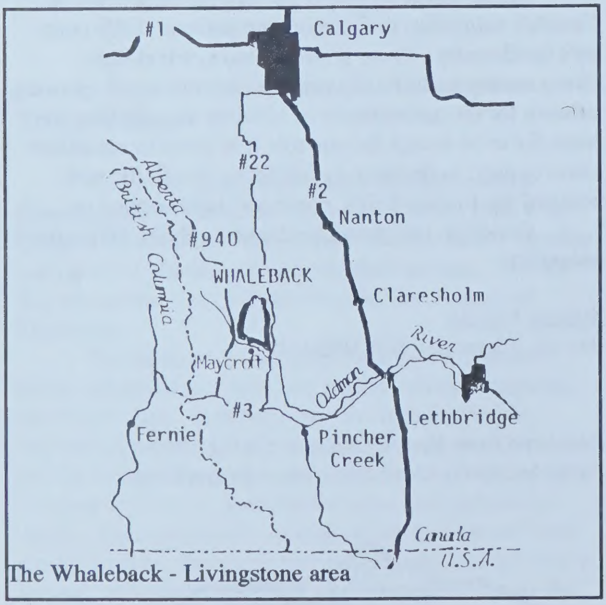
What is the Montane?

It is the land of warm summers with little rain. In winter, the snowfall is less heavy than elsewhere in Alberta, with most of the snow falling in late winter. What snow does fall is soon swept away by chinook winds sweeping down from the continental divide to the west.

As a result, the montane is one of the most important wildlife regions in the province. It is vitally important winter range for Alberta's largest surviving elk and mule deer herds, and is the heart of cougar country. Grizzlies rely on the montane for early spring forage, and a diversity of plant, bird and other species thrives in the areas's rich ecological mosaic.

Famous since the late 1800s among cattlemen, it is a region of rich fescue prairie, sandstone ridges crowned with limber pine and Douglas-fir, sheltered aspen and pine forests, and winding foothills streams.

The montane is the land that lies beneath the chinook arch -- the most ecologically important and quintessentially Albertan of all our province's diverse landscapes. Even so, it amounts to less than one percent of Alberta's land.



The Whaleback - Livingstone area

The Threat

Amoco Canada Petroleum Ltd. plans to drill up to 20 sour gas wells in the pristine landscape of the Whaleback wildland. In order to do this, it will need to build all-weather gravel roads into the region along Bob Creek and White Creek, traversing some of Alberta's finest elk and mule deer range. If these wells prove to be as productive as Amoco hopes, then it will build a pipeline and road network to gather the sour gas and transport it to a separation and dehydration facility and then to a sour gas processing plant.

The Impacts

Once an all-weather industrial road goes into a wildland area, the wilderness qualities of the landscape are lost forever. The Whaleback area is the last extensive montane wildland in Alberta; once it has been roaded there will be no opportunities left to secure montane wilderness for future generations of Albertans. Special Places 2000, the government's newly released plan to complete a system of protected places within six years, calls for at least one large protected area in each of Alberta's natural regions. The Whaleback wildland is the only place where such a protected area can be established in the Montane Natural Region.

Research has shown that species that are sensitive to disturbance -- animals like grizzly bear, elk, wolf and deer avoid areas near roads. This loss of "habitat effectiveness" means that what looks like good elk or bear habitat becomes, because of nearby roads, marginal or poor habitat. Studies in Montana have shown that 25 to 50 percent of elk habitat effectiveness is lost by the time there is one mile of road per square mile of land. If Amoco finds and develops a commercial gas field, road densities will increase and there will be long-term, substantial declines in wildlife populations.

Industrial roads -- even the few that are gated and restricted to industrial use -- are inevitably used by growing numbers of people. The kill of wildlife by legal hunters increases, at least initially, because of the easier access. Worse, poachers, cattle rustlers and vandals have year-round access to formerly remote areas.

Roads beget more roads: in the Castle area of southwest Alberta where previous sour gas developments by Shell Canada have opened up virtually every valley, a powerful off-road vehicle lobby has stymied attempts to restore the damaged landscape. Dirt bikes and other recreational vehicles use existing roads as staging points to cut new tracks into the hinterland. The fragile grasslands and ridge tops of the Whateback-Livingstone area are vulnerable to the erosion and damage of off-road vehicle use which will increase if new roads open up the country

Amoco acknowledges that any gas produced will be extremely poisonous, predicting up to 11.5 m^3 of highly toxic hydrogen sulphide gas being produced by the wells every second. Sour gas has been implicated in a wide range of human health problems as well as white-muscle disease and abnormal abortion rates in cattle.

The Whaleback Hearings

When Amoco first applied to the Energy Resources Conservation Board (ERCB) for a permit in late 1993, it was seeking a fast-track approval of a single well. The ERCB called a hearing to consider the environmental and socio-economic impacts of the Amoco proposal, focusing only on the initial well application. It refused to consider the whole development scenario

At the recent hearing there were recurring themes. The first, as expected, was that the Whaleback is the last relatively unroaded, undeveloped large montane area left in Canada -- a category at the top of our "we don't have it properly represented" list. If we are going to fulfill our commitment to the United Nations Environment Program (UNEP) and International Union for the Conservation of Nature (IUCN) goals through the Special Places 2000 program (i.e., to set aside and protect 12 percent of each natural region in Canada) the only place it can be done for the montane is the Whaleback. To quote Diane Pachal's evidence, "If we can't say no here, we can't say no anywhere. There is no other case so clear-cut".

Associated with the preservation theme is a complex one of fairness within the oil and gas industry. This theme has two aspects.

The first is that there are other operators in the Eastern Slopes, with wells, pipelines, access in or through the montane, who will eventually be required to reclaim their areas of operation to as close as they can get to the "original condition". It is important that these companies have a sample area of undisturbed montane wilderness to act as a benchmark for their reclamation efforts. At this time only the Whaleback can provide this benchmark.

The second aspect has to do with the general corporate style of doing business. Public consultation has been a formal requirement of the ERCB for decades and the standard of consultation demanded has become progressively higher over time. In respect to Crown land development, consultation must also include public interest groups. Groups such as the Federation of Alberta Naturalists, Canadian Parks and Wilderness Society and the Alberta Wilderness Association, with contact names and numbers, are listed with, and regularly mentioned by the ERCB. Local residents, of course, top the list of those who need to be involved in consultation.

Amoco not only failed to contact public interest groups in advance of its application, (which happens often with newcomers to the Crown land scenario), but may actually have misled local residents. There were discrepancies in Amoco's application regarding its public consultation process. For instance, in the orginal application Amoco advised the ERCB that residents and public interest groups had raised no significant concerns about the permit application. In fact, at that time public interest groups had not been advised of Amoco's plans and local residents were up in arms. To approve of Amoco's actions would be an insult to other Eastern Slope operators, and a signal to the industry that the decision-making process concerning the Whaleback is a case of "business as usual" circa 1960.

Finally, the absence at the hearing of those government employees whom we, as the public, pay to act on our behalf as scientists and regulators, was much remarked. The Crown did not permit to be present and testify any of the senior people in regulatory agencies involved in the referral processes for the sale of the Whaleback Crown mineral rights (the Crown Mineral Rights Disposal Committee), the road lease (Licence of Occupation) and the well-site lease (Mineral Surface Lease).

Amoco argued, at considerable length, that these approvals meant that our provincial agents had reviewed the pertinent information, and had agreed that the requirements of the Eastern Slopes Policy (1982 version) and the Livingstone - Pocupine Sub-Regional Integrated Resource Plan had been successfully addressed by the applicant.

However, the absence of any opportunity to question those who participated in the referral processes made it impossible to know what issues actually had been addressed in these processes, and whether the Eastern Slopes Policy and Livingstone - Porcupine Resource Plan requirements were actually met.

The decision on the Amoco application will be a watershed in more ways than one. The oil patch was extremely well-represented throughout the hearing, for a very good reason.

Information on hearings from Maryhelen Posey, #78, 6915 Ranch View Drive, NW, Calgary, AB T3G 1R8.
Rest of article excerpted from Whaleback Coalition Action Alert Newsletter. Spring 1994. Published by Canadian

The Whaleback wildland contains some of Alberta's finest elk range. Photo: W.T. Carlyle

Records of Harlequin Duck and Sabine's Gull at Little Fish Lake

D.B. (Tim) Schowalter

Little Fish Lake is located about 35 km east and a little south of Drumheller. Currently, lake water levels are very low; however, Little Fish is still a comparatively large body of water and much the largest lake in the area. As such, it is attractive to migrating water birds and shorebirds. An advantage to the low water level is that there are wide beaches with little vegetation that permit easy access by foot and unobstructed viewing of waterfowl.

I saw four young Harlequin Ducks at Little Fish Lake on 11 September, 1993. As well, I saw the birds again on 16 September, and suspect that a group of four dark "mystery" ducks I noticed on the lake during the weekend preceding September 11 were the same four ducks.

I did not immediately recognize the birds. I initially thought that they might be young Oldsquaw. They were dark, and had the short bill and general body shape of that species, which I had seen years ago while working in the northern Yukon. All four ducks swam about with their rumps tucked down. I caught a glimpse of a fairly long, rather thin-looking tail on one of the birds, such as might be observed in a young Oldsquaw.

A striking feature of each of the birds was a white spot on the side of the head. In the flat light of a low overcast sky the spot appeared almost luminous against the birds' dark brown heads. The spot was smaller, and much better defined, than the similarly positioned spot of the Bufflehead, a species which occurs regularly on Little Fish Lake. I also noted some lighter coloured areas behind the bill on the side of the face of each bird.

Reference to my field guide determined that the birds were similar in shape to Oldsquaw, but that they were too dark, even for young of that species. However, the white spot on the side of the head was distinctive of Harlequin Ducks.

I was able to watch the birds for over 20 minutes while sitting on a rock near the shore. The four ducks leisurely worked their way along the shoreline, very close to the rocky shore. They fed with their heads underwater but did not tip-up. They were so close to shore, however, that there was no point in tipping up anyway. I am sure that some of the time they were actually walking on the rocks, rather than swimming.

Despite the ducks' heads being under water much of the time, I clearly saw tail feathers out of the water only on two occasions. The duration of both of those events was for much less than a second. I was able to get photos of the birds from about 14 metres.

I assume that the four ducks were feeding on small invertebrates. After the birds had passed, I looked at the water's edge. It was, as is usual in the fall, swarming with the tiny life that also attracts Northern Shovelers and teal to the lake edge.

Once I stood up, the birds' attitude changed immediately. They did not fly, but swam directly, and with some speed, to one of the rock clusters that emerge from the water at the east end of the lake.

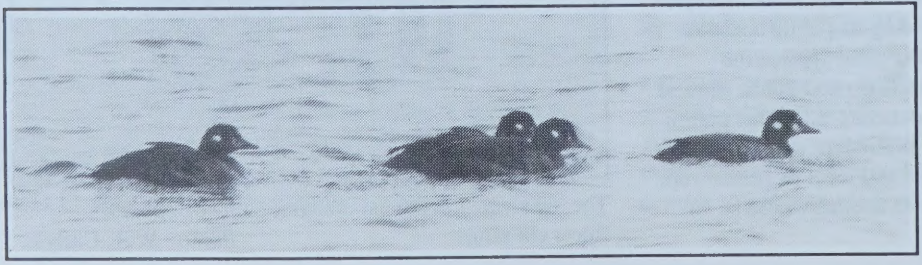
On September 16 I saw the birds again. This time they were feeding well out on the water. I was able to recognize them by the bright white spots on the side of their heads.

According to *The Atlas of Breeding Birds of Alberta* (Semenchuk 1992), there are only a handful of records for Harlequin Ducks in Alberta outside of the species' breeding range along fast-flowing streams in the mountains and the foothills. Given that the females and young are rather dark, small ducks it is not unlikely that the species may occur more often on lakes on the plains, but not be recognized.

A big surprise was recognizing a second species new to me within an hour of seeing the Harlequin Ducks. I spotted a Sabine's Gull at Little Fish Lake on 11 September 1993. I was aware that the species had been seen in the province before and that it was easily identified by its mostly black primaries. However, I was not prepared for a lone, black-headed gull standing at the edge of the water. Although the occurrence of a black-headed gull at Little Fish Lake is hardly unusual, this gull had appeared well after I had last seen either a Bonaparte's or Franklin's Gull.

My identification of the bird was delayed by its being rather approachable. While I noted some field marks as I approached, including a gray, rather than black, head, a black collar, and yellow tip to the bill, I did not recognize the bird as being a Sabine's Gull until it took flight and showed its distinctive black wing triangles.

The bird had a graceful and short flight down the beach where it landed. After a reassuring look in my field guide to verify the identification of the bird, I was able to



Harlequin Ducks at Little Fish Lake.

Photo: D.B. Schowalter

approach within 10 m of it and take pictures. With my approach the gull appeared to be rather nervous and walked away in the shallow water rather than along the sand. It was, however, very much the most approachable of the gulls I observed that day. It seemed to show little interest in gulls or other birds on the beach.

Cued by my bird book, I noted the forked tail of the gull the second time it took flight. This time it flew some hundreds of metres down the beach. I did not follow the bird after this longer flight.

There have been numerous sightings of Sabine's Gulls in Alberta (Semenchuk 1992); however, as far as I am aware, this is the first report of the species for the Drumheller region.

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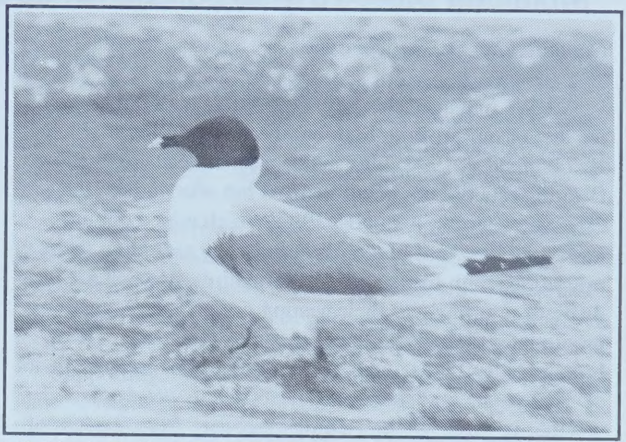

A Sabine's Gull at Little Fish Lake. Photo: D.B. Schowalter

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Duncan Mackintosh winner of the Loran L. Goulden Memorial Award in 1994

David Ealey

The Federation of Alberta Naturalists is proud to present the 19th annual Loran L. Goulden Memorial Award for outstanding work on the natural history of Alberta to Duncan J. Mackintosh, particularly in recognition of his dedication to the conservation of Mountain Bluebirds in southern Alberta. Nobody has done more than Duncan to help re-establish this species in southwest Alberta, southeast British Columbia and the adjacent United States. For many years, he has been the driving force behind the Mountain Bluebird Trails Conservation Group, which maintains the nest boxes, monitors the bluebird nesting success, and bands the young from nest boxes along this international bluebird trail system.

By working hard and sharing his knowledge, Duncan has been able to lead an effective group of bluebird enthusiasts to support an increase in the annual fledgling population from about 250 in 1980 to almost 5000 in 1988. He has written numerous popular articles on bluebird natural history, management and banding results, and has given many presentations to school groups, naturalist groups, junior forest wardens, 4H clubs and the general public.

Other roles he has played in the natural history of the province have been as leader of many summer expeditions of the Lethbridge Naturalists' Society and as President of that group for many years.

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Loran L. Goulden Memorial Award Nominations

Nominations for the Loran L. Goulden Memorial Award for outstanding contributions to natural history in Alberta are sought at all times, but to be considered for the 20th Annual Award they should reach the Chairman of the selection committee by 1st December 1994. The 20th award will be presented at the Annual General Meeting of the Federation of Alberta Naturalists in January 1995.

Nominations may be for contributions in any field of natural history within the province of Alberta. All previous nominations of persons who have not yet received the award will be considered, but nominators of such persons are encouraged to up-date these nominations. Previous Awardees have been: Dick Dekker, W. Ray Salt, Charles D. Bird, Robert Lister, Joy Finlay, John M. Powell, Lois Fenna, Martin McNicholl, Fred Schutz, George Freeman, Tim Myres, Kerry Wood, Marg Reine, Mary Lore, Lloyd Lohr, Cam Finlay, Myrna Pearman, Jack Park and Duncan Mackintosh.

Nominations should be sent in writing to the Chairman or given to another member of the committee (Lloyd Lohr, Stettler; Derek Johnson, Edmonton; Graeme Greenlee, Lethbridge; David Ealey, Chairman Loran L. Goulden Memorial Award Selection Committee, 3903 - 105 St., Edmonton, Alberta T6J 2K7 (434-0841).)

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Mountain Bluebird Trails Conservation Group. 1993. Fourteenth Annual Report

Compiled by D.J. Mackintosh

We managed this year (1993) to get slightly over 50 percent of our all-time-high number of fledglings, which we obtained in 1992. The major problem causing the low fledging rate did not occur in 1993 but was, in fact, the early snow storm in August 1992, which wiped out unknown hundreds of bluebirds before they set out on their migration south for the winter. The birds also had a difficult return trip to their nesting grounds, arriving one month later than we had ever previously recorded. First broods fledged fairly well. Second broods experienced a lot of dead young and abandoned nests due to wet, cool weather in July. We had a quick recovery from our loss of 2,000 eggs in 1989. It could take longer to recover from this year's loss of 1350 eggs.

	1980	1982	1986	1988	1990	1992	1993
Boxes available	560	840	1976	2427	2839	3108	3205
Used by bluebirds	51	101	580	998	992	1951	1234
Boxes used twice	--	--	--	--	--	811	255
Successful nests	50	95	536	917	791	1549	989
Bluebird eggs	263	482	3119	5790	5176	10568	5747
Bluebird fledge	247	387	2649	4902	3872	8232	4473
Nestlings banded	171	307	1727	3730	2794	5701	3715
Adults banded	1	27	101	143	149	1030	162
Sterile eggs	16	97	322	807	641	1241	844
Tree Swallow nests	41*	56*	444*	198*	234*	583*	570*(*Est)
Wren nests	7	5	31	17	65	100	69
Recoveries	--	--	--	--	--	142	96

Between dead young, sterile eggs, and other abandoned eggs, we lost 1,350 eggs combined. No raccoon problems occurred due to nest boxes in affected areas having been fitted with wire mesh tunnels this year. We had about 40 bluebird families fledge from these protected nest boxes.

Our new trail section in the Cypress Hills, southeast Alberta, did well for its second year, considering weather conditions were much the same as in southwest Alberta. They fledged close to 350 nestlings. It's very encouraging to know this trail will be greatly extended next year.

The Mountain Bluebird Trail Conference will be held July 8-10, 1994 at the Black Knight Hotel, Red Deer, Alberta. Programs and applications will be available in early spring. Plan now to attend and bring your friends.

Our only financial support this year was a small grant from Alberta Fish and Wildlife Services.

Fifty-one monitors checked nearly 1,100 km (700 mi.) of trail within our 31,000 km^2 (12,000 sq. mi.) area of southwest Alberta. During the 14 years of published data on bluebird conservation in our area, we have fledged 42,765 Mountain Bluebirds and banded 30,264.

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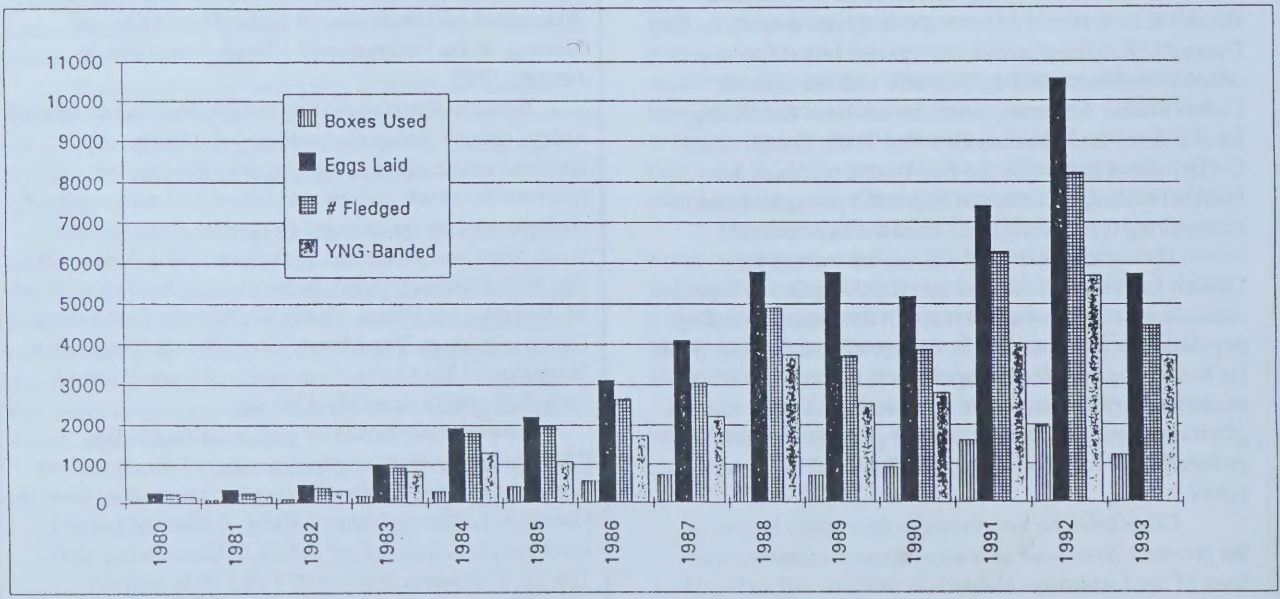
MOUNTAIN BLUEBIRD TRAILS
1980 - 1993



Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Boxes Used	51	86	101	185	304	424	580	722	998	709	922	1613	1951	1234
Eggs Laid	263	359	482	1009	1931	2194	3119	4105	5790	5773	5176	7418	10568	5747
# Fledged	247	260	387	915	1797	1958	2649	3044	4902	3720	3872	6289	8232	4473
Yng Banded	171	164	307	825	1293	1074	1727	2224	3730	2531	2794	4008	5701	3715

Conference Report on "Stewardship '94"

Don Stiles

Stewardship '94 was held March 3 - 5, 1994 at the Coast Plaza at Stanley Park Hotel, Vancouver, B.C. This was a wide-ranging conference with numerous sponsors. The steering committee included members from the Canadian Wildlife Service, Ducks Unlimited Canada, the Federation of B.C. Naturalists, University of British Columbia and the B.C. Ministry of Environment, Lands, and Parks.

The major themes of Stewardship '94 included: revisiting the land ethic, caring for the land and the voluntary conservation of nature on private land.

Field Trip

An opening day field trip to the Fraser River Delta gave participants a lot of information on local land issues and so was more than just a pleasant trip to see nature. Stops of interest included:

* Bridgepoint Market - a market (now defunct) and marina complex that had been built over a swamp in north Richmond. Our leader explained how negotiations had saved part of the swamp for fish and duck habitat.

* Finn Slough - a number of unique squatters' shacks along the south arm of the Fraser delta, built at the turn of the century by Finnish fishermen. About 50 people still live in these shacks and try to maintain a modest lifestyle. They are trying to get a heritage designation, but are having problems with an absentee landlord.

* Reifel Bird Sanctuary - where we heard presentations on the Alaksen Wildlife Sanctuary (adjacent to Reifel), and the recently formed Delta Farmland and Wildlife Trust which is promoting farmland stewardship.

* Brunswick Point - where we saw the efforts of Ducks Unlimited to promote cover crops of grain and grass for wintering waterfowl, and to compensate farmers for growing these crops. Most prevalent waterfowl were Trumpeter Swans, Canada Geese, Mallard and American Wigeon.

* Serpentine Fen Wildlife Area in south Surrey - which also had wintering waterfowl.

While riding the bus in the vicinity of Delta, our leader pointed out two out-of-place-looking, large residential houses in the middle of farmland. Our leader suggested they should not be there. Is this a portent of things to come, with acreages eating up valuable farmland or weak bylaws which allow them to sneak through?

Speakers

Speakers presented on a wide range of topics, and many were from out of province. Displays were included by some of the presenters, particularly local ones. Topics from outside of British Columbia included:

* A community project in the Muskoka area of central Ontario. This was a storefront for technical advice and stewardship strategies.

* "Corporate Forestry Stewardship in Nova Scotia" by a speaker from Scott Maritimes Ltd. The stated goal of this company is "To promote a safe, secure environment for sustainable forestry". Many of its suppliers own private woodlots.

* "Operation Burrowing Owl" by Curt Schroeder, Executive Director of Nature Saskatchewan (formerly the Saskatchewan Natural History Society). This was a good talk which emphasized the use of publicity in getting farmers on board for the project and keeping them there.

* "Supporting Community Programs in Ontario". The Natural Heritage League includes 1500 landowners who have stewardship agreements involving 50,000 acres of land. The league's goals and experiences were discussed.

* "Tax Incentives for Conservation" by Marc Denhez, an Ottawa lawyer. He explained the disincentive to preservation caused by having capital gains tax on land you donate or give away. During the question period he was countered by a representative of Revenue Canada in the audience, who gave an opposing viewpoint. Was this person following Mr. Denhez around?

Alternate Speakers

Some speakers forced us to realize that the whole world cannot be protected, and that not everyone can protect his or her land. For example, there was one land developer who, in designing a subdivision in a virgin forested area, attempted to save as much forest as possible in his landscaping. However, he found that most of the people who purchased his houses had done so because of the lifestyle with its adjacent golf course rather than the landscaping.

There was also an agriculturalist who said, "I am a good steward of my land", but warned that farmers have to make a living. He said words to the effect that "you can't impose protection on my land".

An outdoor writer who owned a piece of bush land in the Kootenays wondered if he was going to have to sell it to loggers to keep himself with a reasonable retirement standard of living.

On a lighter note, an evening program free to the public featured two speakers with the topics "Beginning in Our Own Backyard" and "Landscape Design for Wildlife". In these talks helpful hints in preserving natural backyards were given. One speaker strongly suggested that naturalness stopped at your door, and that raccoons and bats should not be allowed in your house.

The conference was a very interesting way to see how others are attempting to protect natural landscapes and to compare their efforts to the Alberta experience. Background papers given out at the conference have been donated to the FAN Library.

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Does Canada Need an

Lessons from the United States

Stewart Elgie

The United States was the first nation to pass an endangered species act, and boasts the world's strongest endangered species law. The features of the 1973 Act offer valuable lessons as Canada considers legislation for its endangered species.

The Act is best understood by reviewing its five central requirements. The first is that all threatened and endangered species be listed by the Fish and Wildlife Service (FWS). To date, the U.S. has listed 773 threatened and endangered domestic species, and over 75 percent of those are in the endangered category. When the large backlog of candidate species is accounted for, the true figure is probably over 1,300. The backlog is due to the chronic underfunding that plagued the program throughout the 1980s. In Canada, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) presently has 105 threatened or endangered species plus 111 vulnerable species, a category not included in the U.S. list.

The second requirement is that wherever practical the FWS must identify the critical habitat of listed species. Habitat loss is the main cause of species decline in North America, and protecting species is very difficult unless their habitat needs are clearly identified.

The third requirement concerns advance consultation. All government departments must seek the advice of the FWS over any project under their jurisdiction which might jeopardize a listed species or its habitat. This process has proven highly valuable for protecting species, with minimal impacts to economic development. Over 99 percent of all projects referred to the FWS have been allowed to proceed, and less than one percent of those have required significant modifications. Canada would be well advised to develop a legal requirement for advance approval similar to that in the U.S. Act.

The fourth requirement is a prohibition against harming a listed species or its habitat. The U.S. Act outlaws "harassing, harming, hunting or collecting" a listed species, or "significant modification or degradation" of its habitat. This valuable prohibition applies to all activities, including those on state or private lands. However, the FWS may issue a permit allowing incidental harm to a species or its habitat in the course of an activity, provided the proponent develops an acceptable conservation plan to mitigate the harm as far as possible.

The fifth requirement is that recovery plans be developed for all listed species. Due to shrinking budgets, recovery plans have been approved for only about 60 percent of listed species. Where plans have been approved, the ESA's recovery program has been fairly successful. Approximately 40 percent of listed species have halted their decline and are now in stable or improving condition.

In Canada, by comparison, recovery plans have been approved for only 12 percent of the threatened and endangered species. Making recovery plans a legal requirement could substantially increase their number and effectiveness.

The U.S. experience offers several valuable lessons that could help Canada craft legislation that maximizes protection for endangered species and minimizes cost to government and business.

The first lesson is that strong federal leadership was required before the U.S. began to get a handle on its endangered species problem. Prior to passage of the federal Act, responsibility for wildlife conservation lay primarily with the states. The U.S. courts have upheld the constitutional authority of the federal government to regulate endangered species on state lands, on the basis that protection of endangered species is a matter of "national concern". Similar constitutional concerns could arise in Canada over Ottawa's authority to regulate endangered species on provincial or private lands. The Canadian courts would likely also find that protection of endangered species is a matter of "national concern," particularly now that Canada has signed the Convention on Biological Diversity, which calls for legislation to protect endangered species.

Even with federal legislation, close cooperation with provincial and native governments will be necessary to properly protect endangered species. However, preventing the extinction of species is a matter that requires national and in some cases international leadership.

The second lesson is to take a proactive approach to protecting species. The U.S. Act offers no protection to species until they are on the brink of extinction. At that point recovery efforts are often very difficult and very expensive. Identifying species at risk before they are threatened with extinction allows time for gradual preventative measures. COSEWIC's current practice of listing vulnerable species is a good first step, but needs to be accompanied by some legal protection for those species. Also, to be most effective, legislation should emphasize protection of ecosystems, not just individual species.

The final lesson is that Canada should act now, while its endangered species problem is still manageable. The sheer number of U.S. endangered species, and the fact that most already are close to extinction, means that drastic and expensive measures have been required to preserve species in many cases. Canada currently has far fewer listed species, and the large majority of those are not endangered. But the longer we wait to pass strong legislation, the more difficult and expensive the task of preserving Canada's biological heritage will become.

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Endangered Species Law?

Chuck Dauphine

How Current Laws Apply

Most people are surprised to learn that Canada, a country that espouses a strong conservation ethic on the international stage, does not have a national law aimed specifically at protecting endangered species. Does this imply that existing laws are adequate, or would an "endangered species act" provide substantial advantages?

To answer this question, one must examine what protection current laws offer.

The situation is complicated, because wildlife protection in Canada falls under the authority or responsibility of three levels of government, 13 different jurisdictions, and over 20 separate agencies. It is implemented through many different laws and regulations.

The federal government, through its departments of Fisheries and Oceans and Environment, exercises authority over all marine species, inland fisheries, and about 450 of the approximately 520 species of birds (most, but not all, of those which migrate). The provincial governments exercise control over everything else: plants, vertebrates, invertebrates, etc. For many matters, the Northwest Territories and the Yukon Territory are under federal jurisdiction but act like provinces in exercising control over wildlife.

Among the dozens of Canadian laws pertaining to wildlife, only four are specifically dedicated to endangered species, and they are provincial (Manitoba, New Brunswick, Ontario and Quebec). These "endangered species acts" proclaim the need to prevent extinction, list the species endangered in the province, provide stiff penalties for killing and disturbance, and extend protection to important habitat. The territories and most other provinces have incorporated provisions for naming and higher penalties for killing endangered species into their general wildlife legislation. They have no separate legislation for species at risk.

At the federal level, the *Fisheries Act* and the *Migratory Bird Convention Act* permit Ottawa to protect species under its jurisdiction, although without special provisions for those known to be at risk. The *Fisheries Act* also provides reasonably strong habitat protection for coastal and migratory fish. The *Canada Wildlife Act* empowers Ottawa to cooperate with the provinces and other parties to help endangered species. The *National Parks Act* provides strong deterrents for killing and disturbing all wildlife in national parks, which collectively comprise about three percent of the Canadian landscape.

Once implemented, the new *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act* will protect endangered species and other wildlife from poaching, smuggling and illegal sale. Although this line-up of legislation provides a reasonably broad and flexible basis for protecting species and habitats, it tends to focus on preventing the actual taking (i.e., killing) of wildlife rather than on the more significant problem, the protection of habitat. What's more, not one of the laws establishes a process for managing species once they become endangered. Consequently, most government activities to protect endangered species, such as COSEWIC and the Committee for Recovery of Nationally Endangered Wildlife (RENEW), are voluntary in the sense that they are not required by law. In other words, existing legislation may authorize action but does not guarantee it. The extent of application is left to the discretion of the governments of the day.

Though the environmental impact assessment laws being established by Ottawa and the provinces do not refer specifically to endangered wildlife, they do require government departments to assess the potential environmental impacts of their development activities and to modify or avoid those deemed harmful. When conducted in the spirit intended, these assessments would examine impacts on wildlife and give special attention to the needs of species at risk.

To conclude, Canada has a complicated network of wildlife legislation that provides an uneven response to species at risk from jurisdiction to jurisdiction. It does not provide the public with a clear notion of which species are at risk nationally and how they should be addressed.

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Adapted from Recovery, An Endangered Species Newsletter, Winter 1994. Published by the Canadian Wildlife Service..

Burrowing Owl declared "endangered" by COSEWIC in 1986.
Photo: Colin Weir

Purple Loosestrife: What Is the Story?

Patsy Cotterill

Purple Loosestrife is almost a household name in the west these days, thanks to its aggressive spread and the publicity it has attracted. This tall, attractive perennial with long spikes of magenta flowers owes its relatively recent notoriety to the fact that it is an environmental weed rather than an agricultural one. It can form dense stands in wetlands and along rivers and sometimes fills in small lakes and marshes. That it can outcompete native vegetation is bad enough, but most wild fauna cannot use it as they can native plants, so they too suffer--from reduced amounts of food, cover and shelter.

An Exotic Run Rampant

An introduction from its native Eurasia, Purple Loosestrife has become naturalized in eastern North America north of the 35th parallel. It also occurs on both the east and west coasts of Canada and, in the last couple of decades, has spread to the prairies. By 1990 several infestations were known from Alberta (the figure is now around 20). Hence, in an attempt to stop its spread the Alberta government on January 28, 1992 declared Purple Loosestrife *(Lythrum salicaria)* a noxious weed under the provincial *Weed Control Act*. Not, of course, that banning a weed removes the problem. Small patches of loosestrife can be cut down or dug up, but severe infestations cannot be controlled, let alone eliminated. Research is under way on a selective herbicide for loosestrife, and on three insect predators that could reduce its vigor: a weevil that would eat its roots, and two leaf-eating beetles, but none are ready to be released. Why bother to outlaw a plant if you can't get rid of it? Well, the story is a bit more complicated than that. Purple Loosestrife's rise to power may depend mostly on its remarkable biology, but it has not always been a *planta non grata*, as Roger Vick of the University of Alberta Devonian Botanic Garden has dubbed it (Vick 1992b).

Bred for Good Looks

Purple Loosestrife came to North America around the beginning of the last century. Like many weeds, it was introduced both inadvertently, probably in emptied ships' ballast, and intentionally, because of its value as an ornamental crop and as a honey plant for beekeepers (Anderson and Ascher 1992). Its presence was recorded by botanist Frederick Pursh in the *Flora Americae Septentrionalis* (Flora of North America) of 1814 and it was being advertised in nursery and seed-trade catalogues in New York State as early as 1829. By the early 20th century, the plant's popularity had led horticulturists to select and propagate clonally cultivated varieties of it. In the 1920s, in an action that would seem unthinkable today, some of these cultivars were even planted in a marsh in the city of Minneapolis. In the 1930s, a Manitoba plant breeder produced "Dropmore Purple," and the Morden Research Station, operated by Agriculture Canada in Morden, Manitoba, began releasing its famous Morden *Lythrum* cultivars, beginning with "Morden Pink."

"Good" Garden *Lythrum* and "Bad" Wild *Lythrum?*

In the wild the plant didn't start to cause alarm until about the 1930s, when its ability to dominate wetlands and even pastures began to be noticed. By the 1980s, several states and a few provinces had enacted legislation to control it. The legislation did not apply to cultivars. As Roger Vick at the Devonian Botanic Garden (DBG) puts it, a distinction was made between "good" garden *Lythrum*, which almost never set seed, and the "bad" wild kind which produces abundant winged seeds (up to 300,000 per flowering spike) and thus has the capacity for aggressive spread in wetlands (Vick 1992a). The idea has been widely held that cultivars are both sterile and morphologically distinguishable from wild plants. (This is an important point for government inspectors enforcing the law.)

Research and experience have since shown that neither of these assumptions is true. In Minnesota, a state with many wetlands, the legislation was extended in 1988 to include cultivars. Not surprisingly, the furor among nurserymen was tremendous. In Alberta, in the spring of 1992, Alberta Agriculture's Crop Protection Branch was still recommending that "Morden Pink" was safe for garden planting. Now it is saying no such thing. The Alberta Purple Loosestrife Management Committee, formed in 1992 and chaired by Shafeek Ali of the Crop Protection Branch, wants all garden material to be destroyed. (The City of Edmonton is, incidentally, also supporting this stance.)

With this sudden about-face, gardeners and nurserymen can be forgiven for their shock and scepticism. Destroy a beautiful, hardy, innocuous garden plant that doesn't appear to spread? Surely not? Unfortunately, yes. To understand why it is necessary, we need to look a little closer at the biology and history of *L. salicaria* and its relatives.

Heterostyly and Cross Pollination

Purple Loosestrife attracted the attention of no lesser a naturalist than Charles Darwin. Darwin was interested in flower structure and pollination mechanisms and, around the 1860s, investigated the breeding mechanism of Purple Loosestrife (Darwin 1892). Loosestrife shows heterostyly, a condition in which the flowers on different plants have styles of different lengths. (Styles are the stalk-like structures joining the pollen-receptive surface of the stigma to the ovary in the female organs of the flower.) The length of the stamens also varies such that, in a given flower, the style and the anthers, the pollen-producing tip of the stamens, occupy different positions or levels in the flower. Heterostyly occurs in a number of plant groups with tubular flowers (for example, the primrose) and is a mechanism to encourage cross-pollination or outbreeding. *L. salicaria* is particularly complicated in that it is tristylous -- its populations having three different kinds of flowers (known as flower or style morphs).

In the long-styled type of flower (see diagram) the stigma projects beyond the stamens, which form two groups of six, one group with anthers at the mid-level and one group of short stamens. (Remember, the anthers must not be at the same level as the stigma in the same flower.) In the mid-styled type the stamens are grouped into long and short, and in the short-styled type the stamens are long and mid-length.

Bees are the most effective pollinators of loosestrife. When a bee enters the flower it touches the shortest set of reproductive organs (style or anthers) with the underside of its head, the mid-set with the undersurface of its thorax, and the longest set with the underside of its abdomen. Such a mechanism makes cross-pollination likely, but, of course, there is always a chance that a flower stigma will receive pollen from the same flower or from flowers of the same plant. If, however, the genes for a particular flower morph are linked with genes for incompatibility, then self-pollination or pollination by flowers of the same style morph will not produce viable seed.

Workable or compatible pollinations are those in which the pollen comes from anthers that are at the same height in the flower as the style. Thus plants with short-styled flowers can be pollinated by mid-styled plants with short anthers and long-styled plants with short anthers; mid-styled plants by long- and short-styled plants having mid-level anthers; and long-styled plants by mid- and short-styled plants with long anthers, for a total of six compatible combinations out of a possible 18 crosses. Such compatible crosses are termed *legitimate*, while all other types of crosses, or self-pollination, are incompatible or *illegitimate*. Knowing this, it is easy to see why cultivars, each of which belongs to only one of the three style morphs, may appear to be sterile under the conditions under which they grow in gardens and nurseries. A mid-styled cultivar, for example, growing in a garden where it was the only *Lythrum* cultivar would have no opportunity to produce seeds. (Remember, it is self-incompatible.) The same would be true if it grew in contact with other mid-style cultivars (with which it would be cross-incompatible).

Cultivars' Complex Genetic Web

There are further complications to the story of Purple Loosestrife and the *Lythrum* cultivars. *L. salicaria* has a close relative and a look-alike species (though there are minor morphological differences) called *L. virgatum*, which is also an exotic from Eurasia and also tristylous, and the two can cross freely. Also in the picture is a species native to North America, *Lythrum alatum*, Winged Loosestrife, which prefers even wetter habitats then *L. salicaria* but nevertheless overlaps with it. *L. alatum* can apparently cross with *L. salicaria* and *L. virgatum* in the wild, even though it is distylous and has another barrier to hybridization (chromosome number, which we won't go into here but could nevertheless be a significant factor in *L. salicaria's* weedy behavior). *Lythrum* cultivars have been selected in the past from both *L. salicaria* and *L. virgatum*, and from interspecific crosses between these species and *L. alatum*. (For example, varieties "Modern Gleam" and "Morden Rose" were developed by crossing "Morden Pink" *[L. virgatum]* with *L. alatum.)*

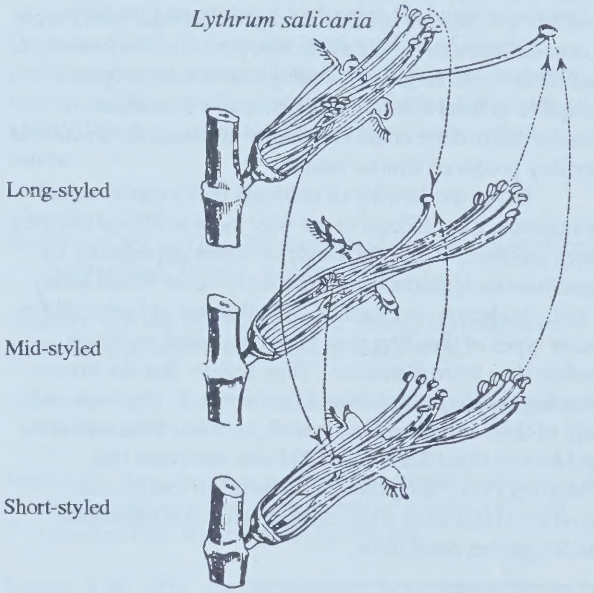


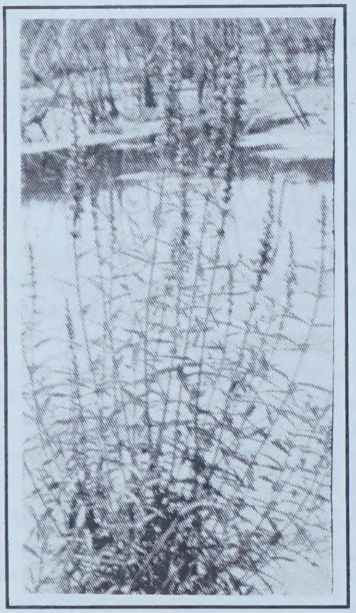
Diagram of the flowers of the three forms of *Lythrum salicaria,* in their natural position, with the petals and calyx removed on the near side; enlarged six times. The dotted lines with arrows show the directions in which pollen must be carried to each stigma to ensure full fertility.

Darwin's illustration of tristylous Purple Loosestrife (Darwin 1982).

Are the Cultivars Sterile or Can They Spread in the Wild Too?

In 1989 Neil Anderson and Peter Ascher of the Department of Horticultural Science, University of Minnesota, set out to settle the matter of cultivar sterility and the controversy surrounding it. Taking cultivars of all three style morphs (short-styled, mid-styled and long-styled), they crossed them (as male and female parents) with wild populations of Purple Loosestrife from Minnesota and Wisconsin and between themselves. Crosses were of the legitimate type except in the case of "Morden Gleam". Although, statistically speaking, seed production did not follow a normal distribution, but was skewed towards zero seed set, suggesting some sterility, none of the cultivars failed to set seed under any of the test conditions. Even "Morden Gleam" which, anomalously, did not set seed with legitimate pollinations, set seed when selfed or hybridized with *L. alatum.* Although cultivar x cultivar pollinations (within the same species, *L. salicaria* or *L. virgatum*, or between these two species) resulted in lower average germination than cultivars crossed with the wild loosestrife population, zero percent germination did not occur in any case, indicating that crosses between cultivars in a nursery or garden could produce viable progeny. Cultivated forms of Purple Loosestrife can thus serve as pollen or seed sources promoting the spread of Purple Loosestrife in the wild. Further, Anderson and Ascher's findings that cultivar x *L. alatum* hybrids can hybridize with wild Purple Loosestrife are cause for alarm too, for in this way weedy *L. salicaria* could be gaining strategic information (genes adaptive to local conditions) from native *L. alatum.* A similar study done at the University of Manitoba on cultivar fertility produced similar results.

Given the fertility of cultivars under experimental conditions, it is difficult to see why more seedlings have not been reported, at least in nurseries where opportunity for spontaneous legitimate pollinations to occur would surely exist. Anderson and Ascher think that use of herbicides or other types of weeding may have eliminated seedlings before they were identified. They believe that the Minnesota legislation, which bans *L. salicaria, L. virgatum* and any of their combinations, is well justified. Research done at Morden Field Station in 1992 also indicated that "Morden Pink," long thought to be safely sterile, can produce viable seed when crossed with wild loosestrife under garden conditions.



Purple Loosestrife
(Lythrum salicaria)

Height - **3 to 6 feet (1-2 meters)**

Stalk - **square, woody, several stalks per plant**

Leaves- **smooth edges, opposite sides of stalk, attached directly to stalk**

Flowers- **long pink/ purple spike, June to Sept.**

Wetlands and Wildlands First!

In the summer of 1992, Roger Vick made the painful decision to destroy the DBG's collection of *Lythrums,* dating back over 27 years. Vick had seen a bad loosestrife infestation in a wetland west of the Garden, one probably originating from garden refuse back in the 1950s, and compared plant samples from it with the DBG plants. He was shocked to realize that he could not reliably distinguish between them.

Moreover, that year he found that some of the DBG cultivars produced seeds. Vick concluded, "The wetlands of Alberta are a precious natural resource, and there is no point in putting them at risk for the sake of a garden ornamental." He explains the sudden panic over loosestrife after all these years of insidious spread, and over cultivars in particular within the last year or two, as due to the increased number of garden plantings of *Lythrum* and the increased number of wild infestations having reached a level where successful pollinations and seed set are statistically far more likely. It is a sad story for horticulturists and gardeners, and environmentalists can sympathize, but most commendably, nurserymen in Alberta have shown great compliance in destroying their *Lythrum* stocks. It only remains for some homeowners to follow suit. Vick is right: ecosystems are more important than aesthetics. Still, the Purple Loosestrife saga makes a fascinating story, illustrating both principles of plant biology and the interactions between plants and man. I doubt very much that we have heard the end of it.

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Two brochures, "Beautiful Killer" and "Purple Loosestrife." Latter still available from Ducks Unlimited or Canadian Wildlife Federation, 1-800-565-6305, or Edmonton Natural History Club.

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Why Do Long-tailed Weasels Climb Trees? And Why Have They Become So Rare?

Dick Dekker

While walking along a road allowance near Beaverhill Lake, on 9 September 1990, I noted a Long-tailed Weasel standing upright in the grassy ditch, about 30 m west of me. After watching it through binoculars for a few moments, I continued my walk. Immediately, the weasel ran east, toward me, for about 10 m and jumped onto the trunk of a lone willow tree growing in the ditch. The weasel climbed very quickly to a height of about 3 m. At my close approach, it moved even higher up into the thin top branches. Eventually, it sat motionless, making no sound, and looked boldly down at me standing below. My head was about 2 m away from the animal. The weasel appeared to be fully adult with an estimated total length of 45 cm including a tail of 15-18 cm.

I have seen weasels in willow trees on two previous occasions in the same general area. Tree climbing by Short-tailed Weasels (Ermine) was reported by Soper (1964). Banfield (1974) stated that "Ermine can climb well and often pursue squirrels and chipmunks in trees." However, in my opinion, weasels ascend trees for a totally different reason: to escape from ground predators. Clearly, the Long-tailed Weasel I saw on 9 September took refuge in the willow tree because of my approach. Probably it reacted to me exactly as it would have to a Coyote or fox.

Tree climbing to escape from canid pursuers is known of cats, both domestic and wild. Pine Martens are arboreal relatives of the weasel family. Less well known is the fact that even mink may ascend trees when pressed hard by pursuers. On a November day in 1968, while Beaverhill Lake was frozen, I ran after an American Mink that fled across a snow-covered pasture. The animal eventually jumped onto the trunk of a poplar tree and climbed high into the branches!

The Long-tailed Weasel has become quite a rare animal on the Canadian plains. In 1982 it was listed as threatened by COSEWIC (the Committee on the Status of Endangered Wildlife in Canada) (Courtney and Smith 1988). It is my suspicion that this weasel's rarity may in part be due to direct predation by wild canids, particularly the Coyote.

During the last two decades, perhaps due to reduced controls, Coyotes have thrived in central Alberta and probably elsewhere on the Canadian plains. In addition, Red Foxes now occupy pockets of prairie habitat near farms and roads that were formerly unoccupied by wild canids (Dekker 1973, 1983).

Foxes are known to be mortal enemies of weasels. The carcasses of small *mustelids* have often been found around fox dens, and field studies in Pennsylvania have provided conclusive proof that foxes are capable of reducing and controlling weasel populations (Latham 1952). In the Netherlands, Ermine became extirpated in coastal dunes after Red Foxes were introduced and became numerous (Mulder 1990).

Most naturalists support the notion that wild predators should be essentially unmanaged by humans. Tolerated by local landowners, Coyote populations are high on pastures around Beaverhill Lake. In the early 1990s, it was routine to see two or more during an afternoon's walk, and in the evening their howling chorus could be heard from several directions at once.

We may be paying a high price for having so many Coyotes around. Besides the local scarcity of smaller predators such as weasels, Jack Rabbits have become very rare around Beaverhill. And ground-nesting birds such as Marbled Godwits seem to be much less common than before.

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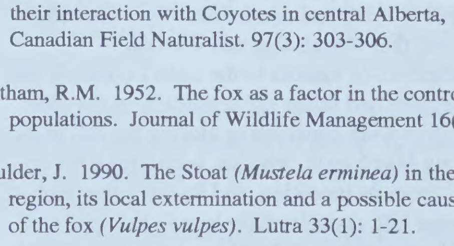

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Adapted from "Tree-climbing by Long-tailed Weasel: an Anti-predator Strategy?" published in Blue Jay 51(3): 179-180.

"Summer Friends" at Lake Louise Ski Area

Margaret Walker

For 17 years now a group of approximately 110 people, known as the "Ski Friends", has operated at the Lake Louise Ski Area as an information resource. These people are excellent skiers who have a great affection for and knowledge of the ski hill, and love to pass on that knowledge to people new to the Lake Louise area. Many of the visitors are from abroad; it is their first time in Canada and their first time at Lake Louise. The "Ski Friends" guide these visitors around the ski hill, show them the configuration of the runs, introduce them to the various levels of difficulty and talk to them about anything to do with the Lake Louise area, the mountain, the weather, what it looks like in summer, and generally act as tour guides.

In the winter the Lake Louise ski hill has many ski lifts. In the summer the owners use only one lift, but the operators have installed a combination of open quad chairs, bubble chairs and completely enclosed gondolas on the one lift. For a small fee, the visitor can ride up and down all day on this Friendly Giant lift which goes from the Whisky Jack Lodge at the foot of the hill to a point close to the Whitehorn Lodge, 1500 feet higher, on the edge of the alpine zone. The lift travels much more slowly in summer than it does in the winter, taking 12 minutes for the ride. The visitor, on reaching the top, can either walk down to the Whitehorn Lodge or can ride in a small open-sided vehicle. At the lodge there is a delightful deck on which there is a map of all the mountains visible from that point. There is a small cafeteria and visitors can sit on the deck and have lunch or relax and admire the view. However, before this year, that was all that was offered.

The numbers of visitors to the Lake Louise ski hill during the summer had fallen off drastically to the point that the operators were considering closing the hill in the summer. Doug Macdonald, who has been a member of "Ski Friends" from its inception, and knows every inch of the Lake Louise hill, conceived the idea in the spring of 1993 of the "Summer Friends". This group of 20 people, would act as tour guides of the Lake Louise hill in the summer, and would show visitors not only where the ski runs were, but also the flowers, the birds and the geology. They would be available to answer questions and would take visitors on short hikes up or down the mountain. When Doug proposed the "Summer Friends" concept the operators were skeptical but agreed to give it a try.

On September 24 the operators pronounced "Summer Friends" a spectacular success and a key part of increased summer visits. One source of visitors had been the tour buses that operate in the summer. On one occasion there were five tour buses before lunch, each with 44 people on board. The visitors were charmed with their trip up the ski hill, from which, of course, there is a spectacular view.

Although I am not a downhill skier, Doug asked me to be part of the "Summer Friends" team because I am able to identify all of the flowers and some of the birds on the hill. I also love to hike and to show people the wonders of our mountain parks. Each "Summer Friend" agreed to be on the hill at least three times (including a full weekend) during the summer. Some of us just fulfilled our mandate, and some of us enjoyed many days on the hill. As a non-skier I learned a lot about the hill and came to wish the summer season was longer.

The "Summer Friends" program began with a training session in late June. We all gathered, dressed for hiking, at the Whisky Jack Lodge and were given some idea of what the program was about. We were told that we would act as tour guides and one of our main jobs was to talk to visitors and to impart our knowledge of the hill to them. Since we were all knowledgeable in one way or another about the hill we could rely on our *forte*. Mine was the flowers. What we saw of interest on a hike to "Wrong Turn" on this occasion were spectacular *Draba ventosa* mounds among the rocks, Indian Paintbrush (Pink), Chickweed and Spring Beauty.

Because this is a ski hill, the natural habitat is disturbed. There are large stretches of groomed grass, some roads used by the small vehicles (which are the only ones allowed on the hill) and stretches of very rough road. I was appalled by the degradation in some areas. Where there should have been spectacular alpine meadows there often were rough, gravelly patches almost devoid of flowers. However, despite the considerable disturbance, there were large areas of the ski runs showing typical meadow vegetation. The areas around trees were less disturbed than the wide open ski runs, and flowers and bushes were also blooming there. The newer runs (less than five years old) have been seeded with domestic grass to control erosion. On the older runs, the natural vegetation has taken over. Of course, if the ski hill did not exist, the area would presumably be forested, and the meadows are therefore relatively new. It will be interesting to see how the whole meadow area fares in the future.

Since there is a large change in elevation on the hill, there is also a change from montane to alpine vegetation. Around the Whitehorn Lodge late in August I found: Fringed Grass-of-Parnassus, Asters, Pink Pussytoes, Butter and Eggs (unfortunately), Rocky Mountain Goldenrod, Orange and Yellow Flowered-false Dandelion, Pearly Everlasting, Golden Fleabane and Prairie Gentian. There is also a variety of terrain including open grassy meadows and small streams where I found American Brooklime, Hooded Ladies'- tresses and Alpine Milk Vetch, also wooded areas where I found Bunchberry, One-flowered Wintergreen, Common Pink Wintergreen, Twinflower, and Heart-leaved Arnica. Higher up there are alpine flowers not found at the lower elevations, such as Heliotrope and Scorpion Weed.

I also found fruits of Bracted Honeysuckle, Canada Buffaloberry, Juniper (Creeping and Common), Contorted Lousewort, Elephant Head, Strawberry and Grouseberry.

Here is a list of all the plants found during June, July, August and September 1993:

Alpine Fir	*Abies lasiocarpa*
Venus's Slipper	*Calypso bulbosa*
Northern Green Bog Orchid	*Habenaria hyperborea*
Hooded Ladies'-tresses	*Spiranthes romanzoffiana*
Barratt's Willow	*Salix barrattiana*
Mountain Alder	*Alnus crispa*
Umbrella Plant	*Eriogonum subalpinum*
Bistort	*Polygonum bistortoides*
Spring Beauty	*Claytonia lanceolata*
Chickweed	*Stellaria longipes*
Baneberry	*Actaea rubra*
Drummond's Anemone	*Anemone lithophila*
Yellow Columbine	*Aquilegia flavescens*
Eschscholtz's Buttercup	*Ranunculus eschscholtzii*
White Globe Flower	*Trollius albiflorus*
Golden Corydalis	*Corydalis aurea*
Rock Cress	*Arabis lyallii*
Draba	*Draba ventosa*
Alpine Wallflower	*Erysimum pallasii*
Stonecrop	*Sedum lanceolatum*
Rhomboid-leaved Saxifrage	*Saxifraga occidentalis*
Alum Root	*Heuchera cylindrica*
Fringed Grass-of-Parnassus	*Parnassia fimbriata*
Arctic-alpine G.-of-Parnassus	*Parnassia kotzebuei*
Swamp Currant	*Ribes lacustre*
Prickly Saxifrage	*Saxifraga bronchialis*
Lyall's Saxifrage	*Saxifraga lyallii*
Saskatoon	*Amelanchier alnifolia*
White-flowered Mtn. Avens	*Dryas hookeriana*
Strawberry	*Fragaria virginiana*
Cinquefoil	*Potentilla diversifolia*
Shrubby Cinquefoil	*Potentilla fruticosa*
Potentilla	*Potentilla ledebouriana*
Wild Rose	*Rosa woodsii*
Arctic Raspberry	*Rubus arcticus*
Sibbaldia	*Sibbaldia procumbens*
Alpine Milk Vetch	*Astragalus alpinus*
American Milk Vetch	*Astragalus frigidus*
Mackenzie's Hedysarum	*Hedysarum boreale*
Showy Locoweed	*Oxytropis splendens*
Black crowberry	*Empetrum nigrum*
Yellow Violet	*Viola orbiculata*
Canadian Buffaloberry	*Shepherdia canadensis*
Willowherb	*Epilobium anagallidifolium*
Fireweed	*Epilobium angustifolium*
Marsh Willowherb	*Epilobium palustre*
River Beauty	*Epilobium latifolium*
Bunchberry	*Cornus canadensis*
One-flowered Wintergreen	*Moneses uniflora*
Common Pink Wintergreen	*Pyrola asarifolia*
Kinnikinnick	*Arctostaphylos uva-ursi*
Mountain Heather	*Cassiope mertensiana*
Rocky Mtn. White Heather	*Cassiope tetragona*
Labrador Tea	*Ledum groenlandicum*
Purple Mountain Heath	*Phyllodoce empetriformis*
Yellow Mountain Heath	*Phyllodoce glanduliflora*
Rocky Mtn. Rhododendron	*Rhododendron albiflorum*
Pink-fruited Grouseberry	*Vaccinium scorparium*
Rock Jasmine	*Androsace chamaejasme*
Prairie Gentian	*Gentiana affinis*
Scorpion Weed	*Phacelia sericea*
Alpine Forget-me-not	*Myosotis alpestris*
Indian Paintbrush (red)	*Castilleja miniata*
Indian Paintbrush (yellow)	*Castilleja occidentalis*
Contorted Lousewort	*Pedicularis contorta*
Yellow Beard Tongue	*Penstemon confertus*
Butterwort	*Pinguicula vulgaris*
Northern Bedstraw	*Galium boreale*
Twinflower	*Linnaea borealis*
Bracted Honeysuckle	*Lonicera involucrata*
Heliotrope	*Valeriana sitchensis*
Common Harebell	*Campanula rotundifolia*
American Brooklime	*Veronica americana*
Orange-flowered False Dandelion	*Agoseris aurantiaca*
Yellow-flowered False Dandelion	*Agoseris glauca*
Yarrow	*Achillea millefolium*
Pearly Everlasting	*Anaphalis margaritacea*
Pink Pussytoes	*Antennaria rosea*
Woolly Everlasting	*Antennaria lanata*
Heart-leaved Arnica	*Arnica cordifolia*
Smooth Aster	*Aster laevis*
Golden Fleabane	*Erigeron aureus*
Compound-leaved Fleabane	*Erigeron compositus*
Fleabane	*Erigeron peregrinus*
Prairie Groundsel	*Senecio canus*
Triangular-leaved Groundsel	*Senecio triangularis*
Rocky Mountain Goldenrod	*Solidago multiradiata*
Common Dandelion	*Taraxacum officinale*

We were delighted with the number of plants sighted, and next year hope to do better. However, this is not bad for a group of people with little previous experience with wildflowers.

If anyone is interested in joining this unique organization, please call Doug Macdonald at 271-7678. No skiing experience necessary!!

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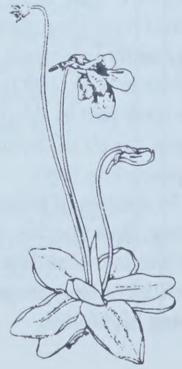

Common Butterwort
(*Pinguicula vulgaris* L.)

FAN Field Trips

The Black Bear Grazing Reserve

Pauline Le Bel

May 7, 1994. A yellow school bus takes 19 eager naturalists north from Edmonton to the Black Bear Grazing Reserve. Everyone is equipped with binoculars, lunch and sturdy clothing. I appear to be the only neophyte in the crowd, but there are plenty of folks here to teach me what I need to know.

Starting with Jim Lange, our guide, who gives me a brief primer on the boreal forest, and emphasizes that because the ground is frozen much of the year, it takes a long time for things to grow. And there's Lyman Matthews who seems to belong in the outdoors, and June Siedel who knows her birds, and Dick Clayton who wears special pants with a leg pocket just the right size for a bird book, and Ann Stefura, who asks me to write this article, and points out local flora and fauna, and Olive Clark who invited me along. I decide I'm in good hands.

I get down on all fours and stroke the Leather Leaf (well-named, you probably could make shoes out of it), the Labrador Tea (some disagreement about whether in fact the tea was worth drinking), Swampfly Honeysuckle, Arrowleaf and Hair Cap Moss.

Jim says that because of the wind we may not spot many birds. But I do manage to hear a Ruby-crowned Kinglet (my first!) and thrill at the song of the Yellow-rumped Warbler. Also spotted are Common Grackle, Goldeneye, Red-tailed Hawks and White-crowned Sparrows. A Common Raven and American Kestrel soar overhead. And perched on a barbed-wire fence, his feathers buffeted by the wind, is a Say's Phoebe. I consider offering him one of Valerie's gloves.

Halfway through the 10 km walk, we stop by a small lake for lunch. I find a dry, grassy hill and stretch out, the heat from the earth warming my body. After lunch, I begin to accept the fact that the wind will be our constant companion for the rest of the day. Pat Greenlee of Lethbridge, who should know about these things, says you can either let the wind get you down or you can embrace it. I decide to try the latter. I plunge forward, arms out, at a slight tilt.

Despite the wind, spirits remain high. Jean Horne recites a short nature poem: "Fungi and algae took a lichen to each other" she says over the Sphagnum Moss. And there is dancing: Jean Burgess and Valerie do a creditable pas-de-deux on the road. Not to be outdone, a pair of loons on the lake treat us to a courting display, a loon ballet of the most exquisite grace and passion.

As we enter the Black Spruce bog, I learn another important lesson. Although the ground may be frozen much of the year, the top few inches can be wet. Next time I'll wear waterproof hiking boots. On the way back, we spot the Say's Phoebe still perched on the fence, looking as if he might be blown off at any time.

At 3:30, feeling a bit like the Dog-eared Lichen we just passed, I spot a familiar yellow shape. To paraphrase my Tai Chi master, I Embrace Wind and Return to Bus. Now where do I sign up for the next field trip?

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* *

Warbler Woes on Willow Walk

Dave Ealey

So it's true-- we didn't see or hear a single warbler on our early spring, FAN field trip (May 8) along the Red Willow Trail in St. Albert. But we did see just about everything else you could expect on a walk in an urban setting that follows a modest-sized river (Sturgeon River) and ends at the outflow of a regionally important migratory bird staging area -- Big Lake (Poston et al. 1990). About 20 FAN members and directors took part in this field trip, which is always considered a treat for all of the hard work that the directors put in on the preceding day.

Our final tally included 54 species of birds, a handful of flowering plants, a frog, four species of mammals and several insects. The complete bird data will be sent in to the Alberta Bird Checklist (ABC) program, but the following are some interesting highlights.

* At least five Cinnamon Teal, including 1 pair, were seen at close range. This duck is one of my favourites and its increase in the Edmonton area over the last few years means that it can now be regularly seen.

* Two Merlins (different birds, seen at different times) were observed flying quickly across the trail. This observation reminded me that after this spring we should have a clear handle on the abundance and distribution of Merlins in the Edmonton/St. Albert area, as a result of a study being conducted by Carla Palaschuk and Geoff Holroyd for the Edmonton Natural History Club.

* An observation of a female Purple Finch carrying nesting material confirms this species as a nesting bird for the St. Albert area, filling in a blank area in the

Alberta atlas (Semenchuk 1992). A male Purple Finch was observed in the vicinity as well.

* Two Great Blue Herons reinforced the designation of Big Lake as a locally important site for this species, compared to migratory bird sites across the prairie provinces (Poston et al. 1990).

Grudgingly, I admit I even learned a little about plants and mammals! One of the plants in flower was a coltsfoot, which we identified first as Arrow-leaved Coltsfoot, then as Palmate-leaved Coltsfoot, then as possibly Vine-leaved Coltsfoot. Our indecision was the consequence of an absence of basal leaves. Finally, when we did find some basal leaves, Patsy Cotterill suggested that the species was most likely the Vine-leaved Coltsfoot, but that it would be wise to check back in a few days to examine full-sized leaves. The Vine-leaved Coltsfoot is thought to be a hybrid with the other two coltsfoot species.

At the very end of our 5 km hike, we were startled to see a bat flying down to the Sturgeon River, just below the St. Albert City Hall patio. The bat appeared to be a big brown bat, and it proceeded to drink about half a dozen times from the flowing water. Each time it drank, the bat faced upstream and into the wind; the motion of drinking was similar to that of a Black Tern that picks an insect from the surface of water. The Big Brown Bat is the most likely bat to be using buildings as roosts in Alberta during the summer. Why it was flying about in the mid-afternoon on a sunny day can only be speculated. It is possible that the bat was disturbed from its roost which we thought might be near the city hall -- just as we left the patio, we noticed a collection of red flashing lights from fire trucks and ambulances lined up in front of the city hall. Or it may have been that the bat had become a little too hot and had to leave its roost to get some water to cool down; May 8 was one of our warmer days this spring, reaching at least 24 degrees Celsius according to my field thermometer.

I almost forget! At the beginning of our hike, we were accompanied by a TV crew led by Mark Sikstrom of the CTV network. Mark said that he was putting together a short clip on disappearing songbirds for the CTV National News, and he wanted to have a few comments from some of the local amateurs, to represent people who are most interested in birds and alarmed about the apparent trends. This clip aired on May 11 and featured commentary from Dr. Geoff Holroyd and Dr. Richard Thomas, along with the comments from Peter Demulder and Alan Hingston taped during our walk.

As usual, FAN field trips are excellent opportunities to learn something about natural history and have fun doing so, as well as getting to talk with a great bunch of people. Will we see you on the next trip?

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Semenchuk, G.P. (ed.). 1992. The atlas of breeding birds of Alberta. Federation of Alberta Naturalists.

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Bluebird Conference

Ellis Bird Farm Ltd. of Lacombe and the Mountain Bluebird Trails Conservation Group of Lethbridge will be co-hosting a bluebird conference in Red Deer on July 8, 9 and 10, 1994. Conference topics will include bluebird research, nestbox trail management, bat conservation and wildlife gardening.

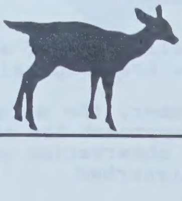
The opening of the Ellis Bird Farm visitor centre will take place in conjunction with the conference. Conference participants will enjoy a pancake breakfast, an opening ceremony and field trips to local bluebird trails. Field trip topics will include bird banding and wildlife gardening.

For more information or to register, contact Ellis Bird Farm Ltd., Box 2980, Lacombe, AB T0C 1S0. Phone/Fax: (403) 346-2211.

The Federaton of Alberta Naturalists has published "A Guide to the Care and Rehabilitation of Injured or Orphaned Wildlife in Alberta". It briefly describes what to do when encountering wildlife that is thought to be under stress, and provides a list of agencies and individuals that should be contacted to assist in dealing with this situation. This list is presented in a regional format and it includes Fish and Wildlife offices, veterinarians with interest in wildlife, and rehabilitation organizations.

This publication was prepared by Derek Whitehouse, who worked in the FAN office during the summer of 1993 under the SEED program.

This booklet is available at the FAN office or through member clubs, for a cost of $2.00 per copy.



What Was That?

Once again there have been some interesting bird sightings in the province that we feel should be shared with naturalists across Alberta. Richard Klauke of St. Paul reported a Common Eider on Cold Lake on November 28, 1993. This may be the first reported sighting for the province. Richard was out at Therian Lake on May 25, 1994 and recorded five Sabine's Gulls. This is the third year that he has recorded this species at the same location in the third week of May.

The May issue of the Lethbridge Naturalists' Society reports a Rock Ptarmigan east of Coaldale in mid-April. This sighting was not verified and they further report that there is some doubt about the bird's origin. In their "Bird News", they also report a record of 40 Short-eared Owls on the Blood Indian Reserve on April 1. Other interesting records were four Forster's Terns at Taber Lake and a Red-naped Sapsucker at Park Lake.

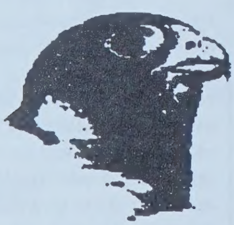
The Sage Brush Chronicle (newsletter of the Grasslands Naturalists) reported that Ben Velner recorded a flock of fifteen Glaucous Gulls on March 13 south of Manyberries. The question was posed, "Is this the first such flock of Alberta?" Lloyd Bennett of Taber recorded a Eurasian Wigeon near Taber on March 20, something he has done for the last several years.

Lakeland Viewpoints reports that the Lakeland Provincial Park and Provincial Recreation Area is a provincially significant breeding area for Common Loons and Red-necked Grebes and that its old growth spruce-fir forests contain significant concentrations of Blackburnian Warblers. Pinehurst Lake is a breeding site for both Osprey and Bald Eagle.

Jim Robertson, Head of Interpretation at Waskasoo Park in Red Deer, has what he calls an interesting addition to the list of "Alberta" birds. There were reports in the Red Deer Advocate of a mysterious red bird that was later identified as a Red-crested Cardinal (an escapee from a local pet fancier). Last year one of these was recorded near Joffre and apparently there is a population surviving in the Calgary area as a result of a reported escape from the Calgary Zoo.

The first official return of a filled-out Alberta Checklist Program checklist was recorded by Jim Lange after the FAN field trip to the Black Bear Grazing Reserve north of Westlock. Thanks Jim. We hope others follow his lead as they go birding this summer.

REWARDING OFFER!!



*** FOR CURRENT SIGHTINGS OF NESTING PEREGRINE FALCONS.** *Alberta Fish and Wildlife Services requires information on breeding Peregrine Falcon pairs in order to document the return of this endangered species once thought to be extirpated by the widespread use of organochlorine pesticides.*

*** LAST SEEN** *nesting along the banks of all major rivers in Alberta prior to the 1970's. Currently, there are several pairs of Peregrines nesting in urban centres but only a few nests have been located in the wild. In other recovering Peregrine populations, released individuals have returned to historic nesting areas before utilizing new areas. Thus Alberta Fish and Wildlife Services, as part of its Southern Alberta Peregrine Falcon Reintroduction Project, has initiated a Peregrine Falcon River Survey to locate some of the 250 Peregrines to be released over a 5 year period (started in 1992).*

*** CAN BE IDENTIFIED BY** *their blue/grey crown, nape and cheek strip below the eye, that makes this sleek bird look like he's wearing a hood with chinstraps.*

IF YOU SEE *this bird, or are interested in participating in a Peregrine Falcon River survey this summer, contact your nearest Fish and Wildlife office, or*

Petra Rowell
Alberta Fish and Wildlife Services
7th Floor, O.S. Longman Building
6909 - 116 St. Edmonton T6H 4P2
(403) 422 - 9535

PETRO-CANADA

Alberta

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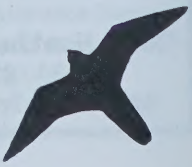
EDMONTON NATURAL HISTORY CLUB

A small token of appreciation will be rewarded to anyone locating a new breeding pair of Peregrine Falcons in rural Alberta.

Remember, the safety of all nesting birds is a top priority! Do not approach the nest and try to limit the distance and duration of your observation such that a nesting bird is never unduly stressed or disturbed.



Book Review

Hoofed Mammals of Alberta

Edited by J. Brad Stelfox,
Published by Lone Pine Publishing.
+ 241 pages. Price $19.95.

The list of authors who contributed to this publication is very impressive. In fact, Dr. Valerius Geist in his foreword calls them a biological *Who's Who.* Dr. Geist briefly outlines Alberta's role in the effort to conserve wildlife. His comments on game ranching certainly give a clear indication of his continued lobby against this practice, but he does make the valid point that, "There is still too little recognition that public wildlife creates wealth and jobs". This is true from both a hunting and non-consumptive perspective.

The main body of this book provides a very useful reference on several different topics dealing with hoofed mammals. The editor's chapter on identification will be of great interest to all naturalists. It deals with identification using scats, hair, antlers and horns, body conformation and colour, "pick-up" skulls and tracks. The line drawings in this chapter, by Sarah Stelfox, are well done, although we are restricted to only a dorsal and profile view. The labelling of the key indicators on the skull is most helpful. The illustrations by Robert Neaves are a definite bonus and one wonders if there are prints available.

The chapter on communication, written by Dennis Chabot, provides insight into the different types of signals sent by hoofed mammals. The detailed tables provide information that will make the observation of these mammals more rewarding. The tables show that the various displays (communication signals) are not random but part of a total communication system.

The following chapter on distribution offers little more information than was presented in Hugh Smith's *Alberta Mammals - An Atlas and Guide.* It does give us a history of translocations in the province and a brief treatment of habitat preferences for the various species. Subsequent chapters on population dynamics and reproduction (Brad Stelfox and John Stelfox), predation (John Gunson, Martin Jalkotzy, Ludwig Carbyn and Laurence Roy) and parasites and disease (William Samuel) are not disappointing as the individual authors write from their vast expertise.

The chapter on hunting and harvest could have provided more of a lead in to the following chapters on management and economic aspects. Presenting historical background and numbers of hunters, sport harvest and success is appropriate. However, I don't feel that this chapter is the place to deal with trophy locations and scores. If such information is necessary at all for this type of book it should be put in the appendix with the Boone and Crockett Scoring Forms.

The chapter on management does provide some insight into ungulate management in the province, but could have dealt with this most important topic in more detail. Most readers of the book, regardless of their backgrounds, would want as much information as possible into the "WHY?" of the present status of the individual species.

The subsequent chapter on economic aspects of ungulate management could have been expanded. The economic question is particularly important at a time when government management agencies are attempting to protect their funding bases. As stated in this chapter, the importance of the non-consumptive uses of wildlife is now recognized and yet this topic is barely dealt with in comparison to the efforts made to appeal to the sport hunting community. The commercialization of wildlife or game farming is examined through position papers presenting the pros and cons of this topic.

The final chapter on morphology, bioenergetics and resource use provides an informative summary of these topics. "The long term concern is to maximize survival and reproductive contribution by acquiring energy with minimum effort and risk. This chapter explores the complex trade-offs involved and how this influences resource use."

Seven appendices are provided and the majority appear to have been added to appeal to the hunting community. Most naturalists would not be looking for information on field dressing, handling and aging big game meat or on Boone and Crockett Club Scoring Forms. As a hunter I feel that these types of topics may be more appropriate for a hunter training manual than a publication with the title *Hoofed Mammals of Alberta.* The information provided on capture and restraint could have been a little more general. The detail presented is more appropriate to the scientist or game manager.

The bibliography is organized by topic (individual chapter) and provides a valuable resource for those who wish to pursue the relevant subject matter in more detail.

Overall, this is a good reference document for those with an interest in our hoofed mammals and is recommended as an addition to a collection of publications on the natural history of our province.

Glen Semenchuk

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Volume 24, Number 3

Fall 1994

ALBERTA NATURALIST

Alberta's Natural History Review

Special Places 2000 - The Bats of Alberta - Townsend's Solitaires - Issues Update
Alberta Moose Survey - Spring Raptor Migration in Southwest Alberta
FAN Summer Field Trip in Cadomin

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CONTENTS

President's Page 42

Editor's Page 43

What Was That! 43

Perspective: Special Places 2000
  Alberta Environmental Protection, Archie Landals
  Wild Alberta Coalition, Maggie Ellen
  Alberta Snowmobile Association, Louise Sherren 44

The Bats of Alberta, Dr. Harold Bryant 48

Bat Houses 49

Observations of Townsend's Solitaires in the Hand Hills - Drumheller Region, (Tim) Schowalter and Donna Sloan 50

Alberta Issues 51

Alberta's 1993-94 Moose Survey 53

Massive Aerial Survey of Moose in Northern Alberta, Dick Dekker 54

Spring 1994 Raptor Migration in Southwest Alberta, Teresa Dolman 58

FAN Summer Field Trip to Cadomin, Alberta
  Cadomin Cave -
  A Young Participant's Perspective, Lisa Semenchuk
  Prospect Creek/Drummond Ridge, Ann Stefura
  Cardinal Divide, Dick Clayton 61

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Deadlines for FAN project reports are:
Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, Curtis Pollock, Box 776, 100 Mile House, B.C. V0K 2E0.
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forest Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Honorary Member: Professor W. Ray Salt

Patron: Hon. Dr. J.W. Grant MacEwan

The Federaton of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or orther features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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President's Page

Harvey Gardner

Many articles in current farm publications reflect an increased awareness of the long-term environmental effects of agricultural and other pesticides. This awareness is leading to an increased use of biological and mechanical control measures against various "pests".

Some vegetable and fruit growers are using large vacuum cleaner devices to clean insects from their plants. There are even giant vacuums used to suck gophers (ground squirrels) from their holes so they can be relocated or otherwise disposed of. (It beats shooting or poisoning them! Shooting is expensive and time consuming, and the usual poisoning methods, if not done really carefully, kill dogs, birds, horses and other non-target species.)

Walkthrough fly traps are being built for cattle--screened structures that cattle can walk through and be relieved of annoying flies. Careful management will encourage dung beetles, which prey on Face Fly and Horn Fly larvae, thus reducing these economically significant cattle pests.

Many plants and insects that are economic or environmental problems are introduced species. As a result they have no natural "enemies" on this continent. Much careful work is being done by researchers seeking creatures that prey on our introduced problems without destroying something native or otherwise important to us. Using Eurasian insects to attack Leafy Spurge and Purple Loosestrife are examples that come readily to mind.

We are all familiar with the concept of buying quantities of "lady-bugs" to control aphids, etc. Dung beetles, for instance, can be nurtured and distributed in a similar manner.

Sheep are being used quite a bit to control grass, shrubs and forbs (broad leaf plants) on replanted forest cut-blocks, especially in British Columbia. Actually these sheep are being grazed intensively ("close herded"), and though their use may be successful from a Forest Service viewpoint, the sheep do not thrive and tend to come home quite thin.

On the Bar S Ranch (our next door neighbor) sheep have been extensively grazed ("loose herded") for eight years to improve plant community balance. The ranch (located at the north end of the Porcupine Hills) has an aspen encroachment problem. However, through using sheep in night-pens approximately 160 acres of aspens have been killed.

The sheep, which prefer shrubs, forbs and soft introduced grasses to hard native grasses, are penned at night in portable electrified fencing placed around an aspen clone. The sheep girdle the aspen. The trees keep sending the anti-suckering chemical to their roots, but because the nutrients from the roots cannot reach the branches, the clone starves and dies.

This year our ranch has begun a similar range improvement program (providing grazing to other producers' sheep), but we night-pen on scrub willow. Meticulous vegetation transect studies are being done under the supervision of range specialists of the Alberta Department of Agriculture so we will know the exact effects of the program.

Many operators in other areas are using sheep and/or goats for brush control and range improvement, as using the animals is less expensive and less environmentally destructive than bulldozers.

Selective logging using horses and mules is slowly regaining acceptance, and if the economics can be proven that trend will strengthen.

In short, while you are hand picking the creepy-crawlies off of your garden plants take heart -- hard-working folks are striving to cut our use of pesticides on a larger scale, too.

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If you know of any naturalist not receiving the Alberta Naturalist, please send us their name and address so we can send them a complimentary copy with an invitation to join the Federation of Alberta Naturalists. Thank you.

Editor's Page

From the Editor:

I hope everyone has been making good use of our much-deserved Indian summer. I live quite near the river valley in Edmonton and have been enjoying watching some of the fall migrants come through. One day I will learn to identify those fall warblers.

In this issue of the *AN* we are introducing our new "Perspective" section, which will include guest editorials on issues of interest to anyone concerned with protecting Alberta's natural heritage. This fall we look at *Special Places 2000*, the provincial response to international commitments to set aside and protect 12 percent of each natural region in Canada. *Special Places* initially was endorsed by the Alberta government, but has been beset by opposition internally, and from various lobby groups. Government support has become, shall we say, restrained. We have invited comment from the government (Alberta Environmental Protection); the Wild Alberta Coalition (of which FAN is a member); and the Alberta Snowmobiling Association (which has expressed concerns with the Special Places 2000 Public Advisory Committee proposals). You are invited to read the Advisory Committee report (available from Alberta Environmental Protection), and draw your own conclusions.

Also introduced this issue is our "Alberta Issues" section. FAN and its members clubs are involved in a wide variety of issues (many related to land use) across the province. We feel it is important to inform readers about these issues, and FAN's role in relation to them, and to keep readers updated on how they are progressing . If you have a local problem with which you would like assistance, feel free to contact FAN, directly, or through one of its member clubs.

Other articles in this issue include background information and commentary on the recent moose survey carried out in northern Alberta by Alberta Fish and Wildlife. There are also articles on spring migration of raptors and the fall migration of Townsend's Solitaires. We have included a couple of short articles on bats, hoping to increase interest in those much maligned but highly beneficial mammals, and in support of the Provincial Museum of Alberta's bat exhibition opening this fall. There is a report of FAN's highly successful summer field trip to the Cadomin area, and "What Was That!" gives us the latest info on interesting and unusual bird and mammal sightings around the province.

R. Edrea Daniel

What Was That!

The publication of the ''39th Supplement to the American Ornithologists' Union (AOU) Checklist of North American Birds'' in the July 1993 edition of *The Auk* indicates that the Rosy Finch has been split again into three species: Gray-crowned Rosy Finch (*Leucosticte tephrocotis*), Brown-capped Rosy Finch (*L. australis*), and Black Rosy Finch (*L. atrata*). The Gray-crowned is the species that breeds in Alberta. Apparently there are some major changes coming out in the 1994 list.

Project Feeder Watch, based at Cornell University, confirmed what a number of people in Alberta observed last winter. The ''irruptions'' of Common Redpolls across North America were the largest in the eight year history of the project. Larger than normal numbers of the Hoary Redpoll and Red-breasted Nuthatch were also reported.

The reports in the *Sage Brush Chronicle* indicate a number of interesting sightings in the Medicine Hat area. Phil Horch was out in early June and recorded three Wood Ducks at Police Point, four Black-necked Stilts and a Forster's Tern at Etzikom Coulee, and his first Common Poorwill in the Cypress Hills. A Pileated Woodpecker was recorded by several observers at Police Point in early May and later in June.

Phil also recorded eight Turkey Vultures at Elkwater. Bob Frew recorded an Eastern Bluebird in the Cypress Hills on June 11. Barry Plante had two pairs nesting in his boxes in the Cypress Hills area. In early July Ben Velner and, subsequently, Dennis Baresco sighted a Black-billed Cuckoo at Police Point Park.

Jason Rogers of Banff reported two rare bird sightings for Banff National Park. On April 23 he recorded a drake Greater Scaup at Horse Barn Ponds. On June 14 he confirmed an earlier sighting by Joel Hagen of a Red-headed Woodpecker in Lake Louise Village.

The Peace River Naturalists have reported some unusual sightings in their newsletter. Andy Raniseth saw a Violet-green Swallow on the Smoky River on May 25. Joan Kerr of Beaverlodge recorded a Long-tailed Jaeger, a Red-necked Phalarope and many Stilt Sandpipers on August 6 at the local sewage lagoon.

The hotline at the Wildbird General Store in Edmonton reports a good movement of warblers through the area; Edgar Jones recorded 20 different species while banding near Beaverhill Lake. Also on the hotline was a sighting by Janet Campbell of 20 Whooping Cranes in a flock of Sandhill Cranes near Elk Island National Park.

Remember to share your unusual sightings with the rest of us.

Perspective: Special Places 2000

Alberta Environmental Protection

Alberta's Heritage is a strategic plan for coordinating the designation and protection of the diverse natural landscapes of Alberta. As part of a world-wide strategy for the conservation of our planet's natural heritage, it works in support of similar initiatives occurring at the provincial, national and international level.

Special Places 2000 is one of the natural resource-based policy initiatives identified by the Alberta Government's 1994 business plan in *A Better Way - A Plan for Securing Alberta's Future. Special Places 2000* is one of the key strategies by which Alberta Environmental Protection will deliver on principles of ecosystem sustainability and sustainable development. Other related initiatives that will be coordinated with *Special Places 2000* include the Heritage Rivers Program, the Forest Conservation Strategy and strategies for the conservation of wetlands, old growth forests, caribou and endangered plants and animals.

On March 11, 1992 the Government of Alberta participated in a joint press conference with His Royal Highness the Duke of Edinburgh in his capacity as the International President of World Wildlife Fund. At this event, the Government of Alberta committed to preparing a "made in Alberta" strategy for completing Alberta's component of Canada's Endangered Spaces campaign. *Special Places 2000: Alberta's Natural Heritage* was tabled as a statement of Alberta's commitment in Aylmer, Quebec in November 1992 at the historic Tri-Council Meeting of federal and provincial ministers responsible for environment, parks and wildlife. A draft policy entitled *Special Places 2000: Alberta's Natural Heritage* was subsequently distributed throughout Alberta.

In April 1993, a Public Advisory Committee was established to solicit public response and recommend a course of action. During the spring and summer of 1993 a series of open houses and group meetings provided opportunities for Albertans to share their views regarding Alberta's Special Places. In November 1993 the Advisory Committee completed their task and transmitted their finding to government. The *Report of the Advisory Committee on Special Places 2000: Alberta's Natural Heritage* contains 37 recommendations that embody the spirit of the public input they received.

On February 9, 1994 the *Report of the Advisory Committee* was released to the public by the Honourable Ken Kowalski, Deputy Premier and Minister of Economic Development and Tourism, and the Honourable Brian Evans, Minister of Environmental Protection.

In releasing the report, the two Ministers provided for a 60-day review period during which they welcomed further comments from the public.

The *Report of the Advisory Committee* generated considerable response, both positive and negative, as demonstrated in frequent media coverage. Over 4000 responses was tabulated by staff of the Department of Environmental Protection. An interdepartmental committee was struck to summarize this feedback. A second interdepartmental committee was set up to review concerns of various government agencies and make recommendations on how these might be resolved.

Since the release of the report Environmental Protection staff have attended several public meetings at the request of concerned groups. In these meetings an attempt has been made to provide an overview of the Advisory Committee Report, as well as provide clarification of specific concerns.

At the request of local and regional Fish and Game Clubs department staff attended meetings in several locations in the province including Stony Plain, Fort Saskatchewan, Athabasca and the Crow's Nest. The Provincial Outfitters Association of Alberta hosted meetings in Easyford, Stony Plain and Edmonton. Concerned ranchers in the Consort and Oyen areas held meetings attended, not only by department staff, but also representatives from the Alberta Cattle Commission and Special Areas. Meetings of the Eastern Slopes Environmental Committee were also attended to address concerns. In addition, department staff met with the executive of some of the off-highway vehicle groups in the province to answer questions on the report.

Ministers Kowalski and Evans have indicated that they will take the summary of public response, interdepartmental recommendations and the *Report of the Advisory Committee* to standing policy committee and then to cabinet for consideration sometime this fall.

Archie Landals, Systems Planner, Alberta Parks Services Alberta Environmental Protection.

Author's Address:
11405 - Jasper Avenue, Edmonton, Alberta T5J 3N4.

Wild Alberta Coalition

Land needs to be protected from industrial development, which, if left unchecked, would consume much of our natural and scenic resources. A balance needs to be found between the development of oil and gas resources, forest and agricultural resources, ubanization, tourism facilities and keeping land in a natural state. The urgency for protection is related to the direct impacts such developments have on the land resource, and also the indirect, multiplier effects. As the world's population increases, threats to the integrity of wildland ecosystems become immediate and options for protection are being foreclosed *daily*. We need protection of key habitats from development, cultivation and overgrazing, so the full range of natural regions and wildlife species is preserved.

World Wildlife Fund Canada recognized the need to protect representatives of all natural regions to preserve global biodiversity and initiated its "Endangered Spaces" campaign Canada-wide. Every province *except Alberta* now has a provincial "Spaces" co-ordinator and some form of legislative or other provincial government framework in place.

Alberta's Special Places 2000 - History

On March 11, 1992, Alberta Premier Don Getty, Minister of the Environment Ralph Klein and Minister of Tourism, Parks and Recreation Don Sparrow committed the government to protect Alberta's natural heritage at a media conference with the Duke of Edinburgh (patron of World Wildlife Fund). In November of the same year, a draft document was released stating that "our goal is to have established, by the year 2000, a comprehensive network of special places that will serve as a legacy for future generations of Albertans." (Leroy Fjordbotten, then Alberta Minister of Forest, Lands and Wildlife, confirmed this government intent at the Tri-Council Meeting in Aylmer. "We have always been committed to protecting our natural environment in Alberta." [November 27, 1992].)

In April 1993, the Advisory Committee for *Special Places 2000* was announced. Alberta Liberal environment critic Grant Mitchell accused the government of procrastination, since the committee was appointed five months after publication of the draft document. In a letter to MLAs, Minister of Environmental Protection Brian Evans stated, "This vision will result in a legacy that satisfies the goals of protection, outdoor recreation, heritage appreciation and tourism."

By May 1993, only six of the twenty-one natural areas that had been promised by the end of March 1993 had been designated.

In September 1993, World Wildlife Fund upgraded Alberta's provincial rating from "D" to "C" on the basis of the proposed program.

The process was further delayed in February 1994 when a further 60 days of public review was announced after the supposed deadline. Further delays occurred in April and May 1994. Instead of giving strong backing to the program, ministers now issued guarded, ambiguous statements:

"A recommendation from that (standing policy) committee will go to cabinet and if cabinet sees fit to authorise the policy..." (Brian Evans, March 30th).

"Whether or not the report is endorsed in whole or in part..." (Brian Evans, April 27th).

"I agree with the general concept, but we'd have to be very careful about what we actually do..." (Premier Ralph Klein, June 28th).

Within the government, *Special Places 2000* is opposed by the departments of Energy, Tourism and Economic Development, and Forestry. The standing policy committee has been beset by problems: one member has moved to British Columbia; the views of another have been discounted as those of a "radical environmentalist"; and a third member has little knowledge of environmental issues (and has, in fact, approached local environmental organizations for assistance!).

Lack of a united front supporting *Special Places* has done little to allay the fears and misconceptions of several powerful lobby groups, fearful of a change in the status quo which might threaten their own fiefdoms. Snowmobile and off-highway vehicle user groups are concerned that their activities may be considered inappropriate in candidate protected areas. An unknown source cited *Special Places* as a move to "lock up" all of the Eastern Slopes and roughly 35% of the province, preventing camping, horseback riding, fishing, grazing and so on. Ranchers believe *Special Places* will be an excuse to withdraw lands from public grazing.

Specifics of the proposed policy have not been discussed, but none of the aforementioned activities would be excluded carte blanche from all candidate sites. However, a co-ordinated opposition campaign by several groups has resulted, causing elected officials to re-think a proposed measure which, on paper, looked guaranteed to win them public support and another term of office.

Where Do We Go From Here?

The government process has been put on hold until at least September 1994. Provincial government employees are uncertain as to the outcome. In the meantime, no new protected areas can be designated.

Based on the initial positive outlook for the government's proposed policy a coalition of environmental organizations decided, in November 1993, to go ahead with a complementary project. The Alberta Wilderness Association, Canadian Parks and Wilderness Society and Federation of Alberta Naturalists pooled resources to initiate *Wild Alberta*, a community-based campaign for establishing a network of representative and unique protected areas, in conjunction with large tracts of wildland. Ecological integrity, biodiversity and recreational/spiritual needs are addressed through the proposal. Thus, although the future of *Special Places 2000* is uncertain, *Wild Alberta* is proceeding.

The campaign has several facets: lobbying for a legislative framework; educating at all levels on the rationale behind and the need for a protected areas network; and the establishment of on-the-ground teams of stakeholders for choosing candidate sites and designing a management plan. Plans will address carrying capacities for wildlife, grazing and recreational use, also appropriate uses (which may vary seasonally), access, identification of local stewards and (through a consensus-building process) a draft management framework for each candidate site.

At a recent conference on protected areas in Saskatchewan, I was surprised by the consensus that Albertans are typically redneck and that the political and economic climate precludes the establishment of a network of protected areas. It was an interesting exercise to step outside the province, compare notes and hear how our problems are seen through the eyes of outsiders (and to get a great deal of sympathy!). All is not negative, however.
Success stories such as the Castle Crown and South Country Coalition give us the incentive to continue. Much of the work is being done by dedicated community volunteers and a few paid staff rather than through provincial initiatives.

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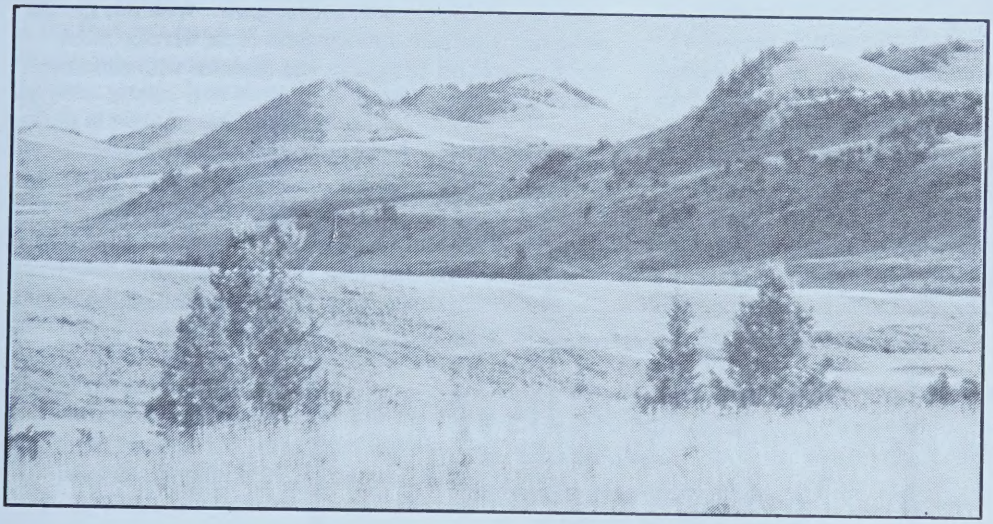
Adapted from Pica, Vol. 14(3): 10-12. Summer 1994.



Whaleback: a potential area for *Special Places 2000* protection.

Photo : Cliff Wallis

Alberta Snowmobile Association

Communication is one of the great wonders of the world! The Alberta Snowmobile Association appreciates the invitation to write to the members of FAN to tell a little about ourselves and snowmobiling, and, more specifically, our concerns with *Special Places 2000*. The Alberta Snowmobile Association hopes that further co-operative partnerships and open dialogue with environmental groups will occur in order that we may work together to understand one another and come to easier consensus over issues with which we are all concerned.

The Alberta Snowmobile Association (ASA) is a non-profit organization governed by its club members and an elected volunteer board of directors, and is the recognized voice of the organized recreational snowmobiler. We are enjoying 22 years in operation, a staffed office at the Percy Page Centre, Edmonton, and are proud to hold executive positions with the Canadian Council of Snowmobile Organizations and the International Snowmobile Council.

As snowmobilers concerned about the environment, we would like to see controlled access and a designated snowmobile corridor system in place, as opposed to total closure. It is recognized that there are definite major impact differences between summer and winter OHV use, and we must remember not to lump all motorized vehicles in the same category.

Dedicated to the preservation and promotion of safe, responsible recreational snowmobiling in Alberta, we see in the recommendations set out by the *Special Places 2000* Advisory Committee a great potential to negatively impact snowmobile development now and in the future.

Our concerns are summarized as follows:

1. The Advisory Committee document is very vague in

that it generates more questions than provides answers, and forces one to imagine the worst scenario.

Because potential locations for protection are not identified, and how access will be handled is not clarified, snowmobilers feel under a continual threat of land closure. It could be interpreted that areas which have had traditional use and which are currently being actively utilized by snowmobilers could become designated protected lands with little or no access.

2. Applying legislation based on the current *Parks Act* would restrict snowmobiling totally. It is well known that it is extremely difficult to change legislation once it is in place. Therefore, *Special Places* should become policy, not legislation. If a revisit to the *Parks Act* were to take place, we would recommend controlled motorized access under certain circumstances.

3. The report's matrix classification, which appears to be based on environmental impact,clearly identifies snowmobiling as an inappropriate activity within designated Special Places. Snowmobiling has been proven to have minimal environmental impact, and there is concern that snowmobilers will "again" be displaced to areas which do not offer facilities, play areas and a full range of landscapes, or lend themselves to lineal and exploration opportunities. Being displaced to areas of less snow coverage is also of great concern.

The Eastern Slopes Policy has caused snowmobilers to see area after area closed to riding. We are very proud of our accomplishments in educating ourselves and others in the protection and preservation of natural habitat, and wise land use, and again would recommend designated routes.

4. Whether the government will honour past commitments (e.g., IRP [Integrated Resource Plans], Access Management Agreements, etc.) is of concern and we would have liked to see this issue addressed more clearly. Existing land management agreements are presently working effectively.

5. Tourism/resort development and economic impacts of motorized recreation have not been sufficiently considered.

Fifty-eight thousand new snowmobiles were sold in Canada during the 1993-94 winter season, at an average cost of $6500, and a total of $377 million. The Canadian Snowmobilers spent $1.4 billion enjoying their sport in that season and with education, new fuel-injected machines and more environmentally concerned and responsible users, the snowmobile industry continues to grow. With this growth comes more pressure to keep areas open, develop more trails, provide better signage and continue with education and awareness programs.

Louise A. Sherren, Executive Director, Alberta Snowmobile Association.

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The Bats of Alberta

Dr. Harold Bryant

Bats are the second largest group of mammals with over 900 species worldwide (only rodents are more numerous). However, because they are nocturnal and most are small, bats are poorly known and often misunderstood. Twenty species of bats are found in Canada, and eight of these species are regular residents of Alberta for at least part of the year. The relatively small number of species of bats in Canada and Alberta is associated with the northern position of the country. The abundance and diversity of bats is highest in the tropics and declines at northern and southern latitudes.

Bats are the only mammals with the ability for powered flight. The bones in the hand are greatly elongated and support the thin, flexible membrane of skin that forms the wings. There are two major groups of bats: the larger fruit bats (such as the Egyptian Fruit Bat), and the smaller insectivorous bats. All Alberta bats are members of the latter group. Insectivorous bats navigate and capture insects at night by emitting high-pitched sounds and interpreting the echoes that bounce back from adjacent objects (a sophisticated form of sonar called echolocation). The use of flying insects as a food source is restricted largely to bats and birds. Together with the ability to echolocate, flight has provided bats with the almost unique ability to hunt flying insects at night. Bats have a high metabolic rate and consume extremely large numbers of insects; as a result, bats are a highly efficient biological control of many insect species.

Alberta bats range in size from the Western Small-footed Bat (weight of 6 grams; total body length 8.5 cm) to the Hoary Bat (weight of 35 grams; total body length of 13.5 cm, with a wingspan of 40 cm). The Little Brown Bat is the most common Alberta bat and is found throughout the province. Some species, including the Big Brown Bat and Hoary Bat, appear to be adapted to all but the most northern parts of the province, whereas others are adapted to particular regions (Long-legged Bat: mountains; Northern Long-eared Bat: boreal forest). The number of species and the abundance of individuals within those species in particular local areas is influenced greatly by the availability of appropriate summer and winter roosts. Bats are inactive during the day, remaining in their roosts in caves, trees or buildings. Most Alberta species are solitary and rarely observed, but the females of Little and Big Brown Bats form large colonies to raise their young.

In Alberta, food sources are available during only the warmer part of the year and bats must either leave the province or hibernate for the winter. The Hoary Bat and the Silver-haired Bat migrate to the southern United States or Mexico for the winter; the other species are known or thought to hibernate here. All Alberta bats migrate, hibernating in different locations from their summer roosts.

Research by Alberta scientists has contributed greatly to our knowledge of the distribution and biology of Alberta bats. Nonetheless, much additional research is needed to adequately understand the life histories, habitat requirements and behaviour of these mammals. With the increasing disruption to their natural habitats, this knowledge is essential for the welfare of these valuable residents of Alberta.

Adapted from the Educator's Activity Book About Bats produced by the Provincial Museum of Alberta, Eaton Centre and Bat Conservation International.

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* *

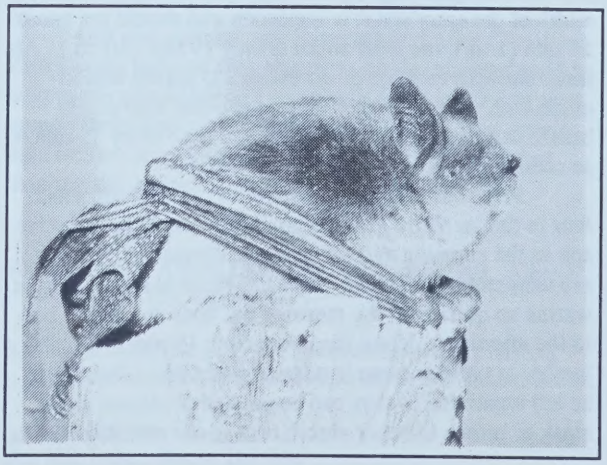
Provincial Museum of Alberta presents...

Masters of the Night - The True Story of Bats

October 1, 1994 - January 8, 1995

Bats represent almost a quarter of all mammal species. They are found on every continent, except Antarctica. Yet they are one of the least known mammals on the planet and certainly one of the most misunderstood. In the Provincial Museum of Alberta's new fall '94 exhibition, **Masters of the Night,** visitors are challenged to view the world the way bats do and to confront the myths we have developed about them.

The exhibition includes life-like environmental settings, such as a medieval hall where everything is upside down and a bat cave, plus a bat science laboratory. Special events include a lecture series, sleepovers, field trips and workshops.



Little Brown Bat Photo: Provincial Museum

The Provincial Museum of Alberta

Lecture Series

Basically Bats: A Vespertilian Lecture Series

A "Bat Man" Explains His Passion
Friday, October 14, 7:30 p.m.

World-renowned Canadian bat expert **Dr. Brock Fenton** give the latest ground breaking research findings on his favorite creatures: bats!

From Transylvania to Tinseltown
Friday, October 28, 7:30 p.m.

Small, dark, and ugly, yet...a movie star! Get the real picture on bats with Edmonton movie critic **Colin MacLean.**

If You Build It, They Will Come
Friday, November 11, 7:30 p.m.

Shatter your misconceptions about bats as Alberta Fish and Wildlife Biologist **Margo Pybus** gives guidelines for watching and attracting bats in Alberta.

Who's Afraid of the Big Brown Bat
Saturday, November 19, 2:00 p.m.

A batty afternoon just for kids. Through a multi-media program, U of C biologist **Robert Barclay** shows kids how important bats are to the world's ecosystem.

All lectures take place in the Museum's Auditorium and include admission to the exhibition

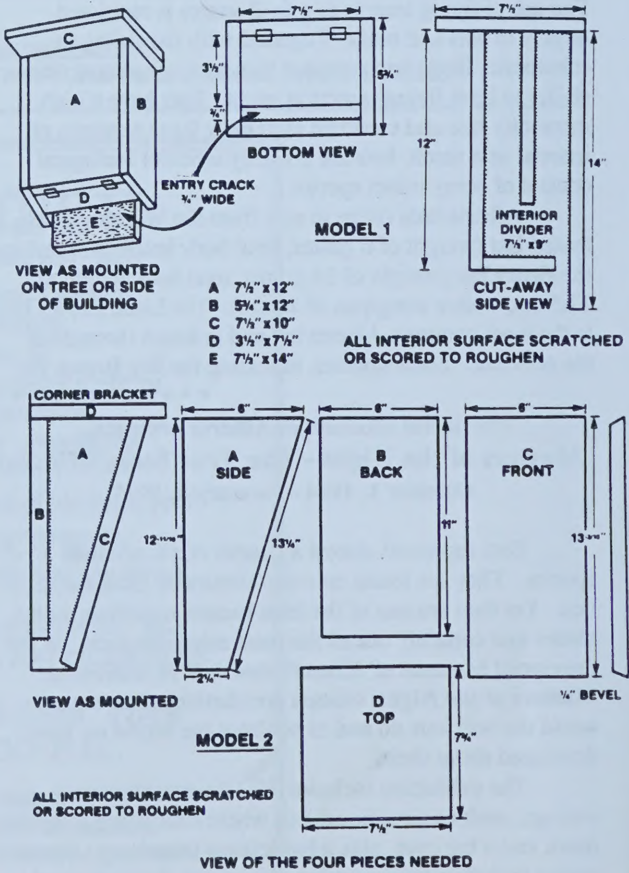
Bat Houses

Bats in Alberta are generally beneficial because they eat insects. Some bats consume up to one-half their weight of insects per night. A typical colony of Little Brown Bats can consume up to 50 kg of insects in one summer. Many of these insects can be harmful or at least annoying, such as mosquitoes. Consequently, you may wish to attract bats to your home or acreage.

Bats have historically inhabited natural roosting sites, such as caves, logs, crevices, cracks and holes in trees. Clearing of forests and other human activities has reduced the number of natural roosting sites for bats. Thus, some bat species have turned to roosting in buildings and other man-made structures. Bats can be attracted to roosting boxes just as birds are attracted to bird houses.

The figure shows two models of bat houses. The width of the entry space is important and should not exceed 25 mm (1 in.); the ideal width is only 19 mm (3/4 in.). All inner surfaces must be rough enough to permit bats to climb with ease. Surfaces may be abraded with a steel brush. Alternatively, a saw cut 1 mm deep every 15 mm or so creates a satisfactory surface for bats.

Place bat houses on tree trunks or buildings about four to five m above ground, preferably where they receive sun in the morning and shade in the afternoon. Since bats are temperature sensitive, place the house at a site where it warms up quickly in the morning but does not get too hot in the afternoon. Make the house from 19 mm (3/4 in.) lumber to provide some insulation overnight. Houses can be left unpainted or they can be painted or stained either black or brown to better absorb heat in the morning.



C
A
B
D
E
7½"
3½"
5¾"
¾"
BOTTOM VIEW
ENTRY CRACK ¾" WIDE
VIEW AS MOUNTED ON TREE OR SIDE OF BUILDING
MODEL 1
7½"
12"
14"
INTERIOR DIVIDER 7½" x 9"
CUT-AWAY SIDE VIEW
A 7½" x 12"
B 5¾" x 12"
C 7½" x 10"
D 3½" x 7½"
E 7½" x 14"
ALL INTERIOR SURFACE SCRATCHED OR SCORED TO ROUGHEN
CORNER BRACKET
D
A
B
C
VIEW AS MOUNTED
6"
A SIDE
12 11/16"
13¼"
2¼"
6"
B BACK
11"
6"
C FRONT
13 3/16"
¼" BEVEL
D TOP
7¾"
7½"
MODEL 2
ALL INTERIOR SURFACE SCRATCHED OR SCORED TO ROUGHEN
VIEW OF THE FOUR PIECES NEEDED

Adapted from Alberta Agriculture Agdex 684-13, March 1989.

Observations of Townsend's Solitaires in the Hand Hills - Drumheller Region

D.B. (Tim) Schowalter[1] and Donna L. Sloan[2]

Winter observations of Townsend's Solitaires on the plains of Alberta are common enough so as not to rate specific comment from editors and compilers of Christmas Bird Counts. During the 1992 count, Townsend's Solitaires were observed at Calgary, Edmonton, Horseshoe Canyon and Medicine Hat (Slater 1993). While the birds are known to occur widely in Alberta during winter, the timing of their movements to and from the plains is evidently not well known.

Townsend's Solitaires usually winter in the western United States and Mexico. Fall migration is reported to occur in late August and extend into October with spring migration lasting from early April to late May (Semenchuk 1992).

Both authors are familiar with Townsend's Solitaires, having observed the species numerous times in the mountains. Also, the birds we saw were rather approachable; a typical observing distance of 10 to 20 meters facilitated accurate identification. Our observations of migrating birds are summarized in Table 1.

Table 1. Spring and fall observations of Townsend's Solitaires in the Hand Hills - Drumheller region.

Date(s)	Location	Observer(s)
28 Sept. 1991	NE 15-31-19 W4	DLS
3 Oct. 1992	NW 10-29-17 W4	TS
5-10 Oct. 1992	NE 17-31-18 W4	TS and L. Hess
8 Oct. 1992	West of Hand Hills Lake	TS
10 Oct. 1992	North of Little Fish Lake	TS and D. & D. Chostner
18 April 1993	Little Fish Lake	TS
23 Sept. 1993	SW 16-30-17 W4	TS

In addition, one of us (DLS) saw a solitaire in Fox Coulee near Midland Provincial Park on 4 February 1990. That observation supports those made during Christmas Bird Counts at Horseshoe Canyon in suggesting that the Red Deer River Valley near Drumheller is a regular wintering area for a few Townsend's Solitaires.

The spring and fall observation dates, while limited in number, generally agree with those published for migration of the species. The fall dates are concentrated in late September and early October, somewhat late in the period of migration suggested in Semenchuk (1992).

We consider the observations to be of migrating birds as all sightings, except that of 23 September 1993, were made either in farmyards where the birds were not seen during the winter, or in small clumps of relatively isolated bush which seemed to lack resources sufficient to support a solitaire during winter.

All observations were of single birds. With the exception of the bird observed over six days in a farmyard at NE 17-31-18 W4 the birds were observed only once.

A Townsend's Solitaire Photo: Tim Schowalter

All of the birds appeared to be feeding when observed. The feeding behavior was similar to that of Mountain Bluebirds. The birds would perch on a fence post or exposed branch between 1 and 1.5 meters from the ground and fly down to the ground or, occasionally, attempt to capture prey in the air. None of the birds were thought to be feeding on berries which are evidently the primary food during the summer (Semenchuk 1992).

Two birds exhibited different feeding behavior from the others. The bird observed on 10 October 1992 scratched at leaf litter on the floor of a small aspen clump and fed on the exposed food. After a few minutes the bird stopped scratching and perched on a fence post.

The bird observed on 23 September 1993 was seen to repeatedly hover briefly about 1.5 meters in front of the face of a sheer bank in a gravel pit. The bird would fly directly to the bank, lightly contact it, then fly up, back and down to resume hovering. The behavior was observed to be repeated five times before the bird left. Inspection of the bank revealed numerous torpid hover flies on it. Presumably, the solitaire was feeding on the flies.

Our observations and those made during Christmas Bird Counts indicate that observers on the plains should be alert to the possibility of Townsend's Solitaires being seen around farmyards and small clumps of trees. The species may well be more numerous on the plains as a migrant than present records indicate.

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Alberta

Whaleback

The hearing on Amoco Canada Petroleum Ltd.'s application to drill an exploration well in the Whaleback concluded on 30 May 1994. On September 8 the Energy Resources Conservation Board (ERCB) rejected the application. In its decision the ERCB indicated that the Whaleback has been identified as an important area for wildlife. In fact, the Integrated Resource Plan for the region had identified the well site as an area of critical habitat. The ERCB also recognized the importance of the Whaleback as one of the largest areas of intact montane ecosystem in Canada and the need for *Special Places 2000* to proceed and identify these sensitive areas.

It is only since the passing of the *Environmental Protection and Enhancement Act* in September 1993 that the ERCB has been required to determine the effects of the project on the environment. Amoco has the option of the appealing ERCB decision to cabinet.

Wildlife Management Advisory Committee

This committee was established to advise the Minister of Environmental Protection on a number of areas including consideration of priorities relating to wildlife under the Buck for Wildlife Program, priorities under the Humane Trapping, Wildlife Support and Waterfowl Protection programs, and changes to wildlife management programs, strategies or seasons.

By a Ministerial Order, FAN is represented on this committee along with the Alberta Fish and Game Association, the Alberta Trappers Association, the Great Council of Treaty Eight First Nations, the Metis Settlements, the Professional Outfitters Association of Alberta and one member representing the public at large.

At the last meeting in June, the committee focused on habitat retention on private land. Two recurring themes came out of the discussion:

1. the lack of coordination in delivery of government programs on Crown lands, which needs to be addressed simultaneously with habitat retention on private lands.

2. the extensive and rapid clearing of merchantable timber currently taking place on private lands, which is removing important wildlife habitat in many areas.

The Committee endorsed the need for habitat retention programs in the White Area (the province's agricultural area), but recommended that efforts be focused on holders of large land bases. It also recommended that existing landowner habitat retention programs be maintained. Allocations for both the Buck for Wildlife Program and the Wildlife Enhancement Fund for 1994/95 were discussed.

Forest Conservation Strategy

The initial public discussions for developing an Alberta Forest Conservation Strategy through a consensus building process were held in March 1993. Participants in the first meeting, representing the forest industry, environmental groups, the academic community and government, endorsed the initiative. A Stakeholder Advisory Group was formed along with a permanent Steering Committee, Strategic Issues Working Groups and Community Working Groups. FAN is involved through the Strategic Issues Working Groups.

The goal of this strategy is "To maintain and enhance the long term health of our forests, for the benefit of all living things locally, provincially and globally while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations". Developing the strategy is scheduled to take two years with completion in the spring of 1995. Phase One, the initiation and design, is completed. Phase Two, the development of strategy, is underway. This phase included a Stakeholder Advisory Group Workshop in Edmonton in early June, at which FAN took an active role. The summary record of that meeting is now available and the Discussion Draft is to be ready in December. Phase Three, the public endorsement process, is scheduled for March 1995.

Athabasca River Sandhills Local Integrated Resource Plan

The draft of this plan was presented to the public in September 1991 to solicit public input. The major issues identified at the time were the unrestricted use of off-highway vehicles and the protection of the area's sensitive ecological resources. The plan was approved by the Minister of Environmental Protection in June of 1994. As part of the implementation of the total plan, an Access and Protection Plan was initiated to provide a detailed review of motorized and nonmotorized recreation use within the planning area. The plan will identify a trail network that is suitable for various recreation uses, as well as finalize the boundaries and allowable activities for designated protected areas. Public meetings, including FAN representation, were held in July and August 1994 in Barrhead and Fort Assiniboine.

Local municipal politicians, and an editorial in the Barrhead Leader, expressed the opinion that the agenda for this process was being "hijacked" by off-highway vehicle users. However, there seems to be a consensus that the Alberta Parks Service, with its strong position on protection for the area, got the agenda back on track.

Issues

Stony Trail Bridge

This issue is being handled principally by the Calgary Field Naturalists. The City of Calgary is proposing a bridge which will produce very significant alterations to Twelve Mile Coulee. Because the applicant (City of Calgary) failed to include an application to Navigable Waters Protection regarding these alterations, FAN submitted a notice to NWP that these changes were included in the City proposal. This notification was instrumental in assuring that a hearing on the proposal would be held.

Coleman Pipeline Project

The Coleman pipeline is a proposal for a collector pipeline for three existing gas wells operated by Shell Canada in the Coleman area, with associated road access.

Shell offered tours of the area in August, and the main difficulty with the proposal is with the choice of road access. FAN is concerned that such projects do not create new access into relatively undisturbed areas. An existing road, the Hagen Loop, could be upgraded for year round use. Doing this upgrade would almost certainly increase other use, including winter use. Alternatively, an existing "trail" could be upgraded for year round use. This proposal would amount to constructing a "new" road, but in this case the road could be closed to all uses but Shell's well access. When Shell no longer needed the road, it could be reclaimed. Either solution is manageable, and Shell's preference, the "new" road, seems likely the best answer in the long run. This proposal may go to hearing; if it does, and FAN participates, it will be to support the application.

Pine Coulee Water Management Project

This project is a proposal by Alberta Public Works, Supply and Services, to construct water management facilities on Willow Creek, near Stavely, and to construct an off-stream storage dam in Pine Coulee. A joint Canada-Alberta panel has been empowered to conduct a public review of this proposal. The purpose of the review is to address the environmental impacts of the proposal, as well as the socio-economic effects directly related to these environmental impacts, especially those which would have an impact on aboriginal interests. The Panel's final report will incorporate both the Alberta Natural Resources Conservation Board's decisions on matters that fall within provincial jurisdiction (under the provisions of the *NRCB Act)* and matters that fall within federal jurisdiction in accordance with the requirements of the Environmental Assessment and Review Process.

The Pine Coulee Coalition, which FAN has joined, is questioning the extent to which the Environmental Impact Assessment will address the long term impacts on the Willow Creek Basin. The coalition feels the scope of the EIA is too narrow and that impacts associated with the project go far beyond the project area.

Ryley Toxic Waste Dump

In June 1991, Laidlaw Environmental Services (LES) purchased a facility in Ryley from Newalta Environmental Services, which was operating a hazardous waste transfer station and a Class 1 designed hazardous waste landfill. Laidlaw had indicated its intent to operate the facility in the same manner as Newalta, but the licence issued by the provincial government to Laidlaw was more restrictive than the one applied for by Newalta. In 1993 Laidlaw applied to amend its existing licence. It requested the company be allowed to operate a tank farm; to pre-treat hazardous waste; and to permanently dispose of hazardous waste in the landfill. It also requested it be permitted to construct four new cells on its property to accept hazardous waste.

FAN's primary concern is that this facility is located in the Beaverhill Lake drainage basin. Beaverhill Lake is a designated RAMSAR site, which is a wetland of international importance, especially as waterfowl habitat. One major objective of the RAMSAR convention is "to stem the progressive encroachment on, and loss of wetlands, now and in the future".

In May of 1994, Alberta Environmental Protection issued final terms of reference for the Environmental Impact Assessment for the Laidlaw application after soliciting public input into the process. Laidlaw has indicated that its draft Environmental Impact Assessment will be available in early October and that a public review process will follow. FAN is registered as an intervenor in this process and is being sent Laidlaw's documentation.

Norcen Well Application

Norcen Energy proposes to drill a well north of Blairmore in an area that was once heavily mined. The first proposed site was examined and found to be unworkable owing to the number of old mine galleries it would penetrate. The alternative site chosen by Norcen appears to be acceptable in regard to any environmental impacts. FAN's concern with this proposal is the implications of further development in the event that this well is successful. Any further development cannot extend access into critical wildlife habitat, especially areas supporting reintroduced Mountain Goats.

Alberta's 1993 - 94 Moose Survey

Editor's Note:

Dick Dekker's article, (next page), provides commentary on Alberta's northern moose survey carried out in 1993-94 by Fish and Wildlife Services. As background to that article, we thought it would be useful to provide readers with some of the survey results as presented by Fish and Wildlife at its recent public meetings.

Alberta Fish and Wildlife surveyed moose populations across the northern half of Alberta during the winter of 1993-94. The purpose was to obtain current data on numbers, densities, and bull : cow : calf ratios throughout the area, much of which had not been surveyed for several years. The increased effort on moose management in northern Alberta was in response to apparent population declines and complaints of low proportions of bulls in the moose population.

Moose populations were surveyed in 46 wildlife management units (WMUs) within five Moose Management Areas (MMAs). The census method used in this survey was the stratified block technique, a computer driven survey system developed in Alaska. Using this method habitat and relative moose abundance were assessed in each WMU. Stratification into high, medium and low (moose density) units was done from Cessna 185 aircraft. Then survey units were randomly selected from each strata and were flown by helicopter. A total of 16,000 moose were sexed and aged (calves or adults). Observations of elk, deer, caribou and wolves were also recorded.

Other information was collected through a tooth sampling progam (to develop age class profiles on bulls), and from reproductive tract sampling (for information on cow pregnancy rates).

The post-hunting season moose population for the entire survey area was estimated at 81,000 (0.25/km^2). There were an average of 46 calves per 100 cows in the five MMAs studied. Estimates ranged from 30 to 70 in different WMUs. A minimum of 50 calves:100 cows entering the yearling cohort is desirable; recuitment below 35 calves:100 cows would result in a population decline.

Average bull population estimates were 34 bulls per 100 cows in the five MMAs. Bull ratios varied from 9 to 95 bulls per 100 cows, with the lower estimates occurring in southern areas with more hunting pressure. In the more productive (higher density) WMUs -- generally the more southerly areas -- a bull:cow ratio in the preseason of approximately 40:100 is considered a reasonable target by Fish and Wildlife biologists. In the northern, less productive WMUs, a bull:cow ratio of 50 -60:100 is considered desirable. It is clear that in some of the southern WMUs ratios are well below moose management objectives.

From a bull population perspective at least one-third of bulls should be experienced breeders (i.e., more than 2.5 years old). In the southern MMAs between 18 and 29 percent of bulls and in the two northernmost MMAs 52-56 percent of bulls were >2.5 years old.

Generally speaking, moose populations were greater than expected in northern areas, but below expectations in more southerly WMUs where most of the hunting pressure occurs. In those southern WMUs with more productive habitat an overall density of at least 2 moose/mi^2 is considered achievable by Fish and Wildlife. In those areas which have had varying degrees of habitat alteration through agriculture, an overall density somewhat below two is considered reasonable. In more productive northern WMUs 1 moose/mi.^{2} is thought to be a desirable target; while northern areas with poor quality habitat cannot be expected to support more than 0.5 moose/mi.^{2}.

Based on survey results Fish and Wildlife recommended that the bull harvest be reduced in those WMUs with excessive (greater than 50%) harvest and /or low (less than 33:100) preseason bull:cow ratios. It was proposed that the Antlered Moose Calling Season (draw) be extended by one week which would reduce the General Season by the same amount. Fish and Wildlife also proposed that there be an increase in the proportion of the allowable harvest assigned to the Antlered Moose Calling Season in those northern WMUs where the current percentage of bulls harvested is very low and the bull:cow ratio is very high.

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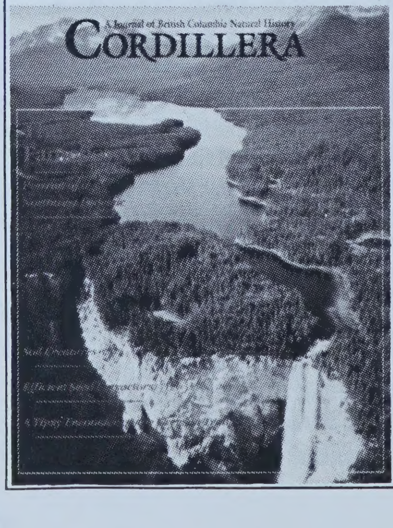
Syd Cannings, Chair
Cordillera Management Committee



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Massive Aerial Survey of Moose in Northern Alberta

Dick Dekker

Are there enough moose in Alberta's forests for predators and people? The age-old question has pitted native against non-native hunters and has raised cries for another go at four-legged competitors, particularly the wolf.

Slowly dipping his antlers from side to side, showing off the great size of the palmated blades that alternately reflect the light of the moon, the bull moose steps into the forest opening. Snorting belligerently at a rival hidden in the woods, he looms up in the dusk like an apparition out of the prehistoric past when mammoths and sabre-toothed tigers reigned over the land.

Standing nearly seven feet tall at the shoulder and weighing a thousand pounds, he is among the last of the giants, lord of the north woods. Fearless and defiant, he dwarfs his canid enemies and refuses to run from them, exhibiting a stubbornness that makes him vulnerable to humans who have always killed by treachery, from a distance, with arrows or bullets. Man, the unequal savage, will strike the bull down in the prime of life, in the glory of his courting days, for which he has prepared himself during the long summer of solitary existence.

In the great boreal forest that encircles the globe like an insulating mantle of evergreen, moose meat has been a staple for indigenous hunters, the two-legged kind as well as furry quadrupeds, for thousands of years. All across northern Canada, the big browsers continue to provide subsistence for native bands and other rural residents. The pendulous-snouted, antlered head of *Alces alces* also constitutes a coveted trophy for visiting sport hunters, generating economic benefits to moose outfitters and guides.

In Alberta, big game outfitting annually raises $23 million in spin-off revenues. In 1992, the provincial government sold nearly 38,000 moose licences at $30 a piece. However, only 20 percent of hunters ended up actually bagging a moose. The low hunter success and the low numbers of moose bulls in some regions has vexed northern Alberta residents for years, sparking questions and accusations whenever government officials show up at public meetings in rural communities. Demands for action are often contradictory, ranging from wolf control to curtailment of the hunting season and the closure of trails to all-terrain vehicles.

Moose bull in Elk Island Park. Photo: Tom Branch

The issue has pitted white residents against natives who have the right, established by treaty, to shoot unlimited numbers of moose for personal use. To make matters more difficult, in 1993, the High Level Tribal Council sent a letter to Alberta Premier Ralph Klein demanding a moratorium on moose hunting by non-natives.

Massive Aerial Survey

In response to the native demands, Alberta Fish and Wildlife Services decided to take inventory of moose stocks. Were they really as low as people thought? During the winter of 1993-1994, Fish and Wildlife conducted a massive aerial survey to determine the status of moose in the northern two-thirds of the province. The survey covered 328,288 square kilometers of forest and muskeg stretching from the central foothills to the eastern and northern boundaries.

The program's cost, $1.8 million, was borne by the hunters themselves from the Wildlife Enhancement Fund, built up through a surcharge on the sale of licences. The survey involved as many as 12 helicopters and 5 fixed-wing aircraft at one time. A total of 130 persons assisted as volunteer observers. Flying at a height of about 50 meters over the snow-covered woods, a crew of four counted all animals seen in 950 sample units in five Moose Management Areas (MMA). Data from each flight was extrapolated via computerized census techniques developed in Alaska to obtain estimates for each unit and MMA.

The results of the survey were said to be encouraging. A total of 16,000 moose were actually looked at and classified as to sex and age. The population for the entire area was estimated at 81,000. Inventories were better than expected in northern MMAs, but below expectations in more southerly MMAs where most of the hunting pressure occurs.

There was an almost even ratio of bulls to cows in the extreme north, but as few as nine bulls per 100 cows in some southern survey units. Overall, the moose density was 40 per 100 km, ranging from a low of 10/100 in the northernmost MMA to a high of 53/100 in the Edson/ Whitecourt region. As a benchmark for reproduction and potential herd growth, the number of calves appeared fair at 48 per 100 cows. What do these figures really mean?

Moose occur in all forested regions of the Alberta, but their numbers have fluctuated greatly during the 1900s, from extreme lows at the turn of the century to periods of abundance in the thirties and sixties. The principal causes of the latest decline have been listed by Alberta Fish and Wildlife Services in the following order: predation, habitat manipulation, increased access, access technology, poaching, tick infestations, native and recreational hunting.

Veteran moose biologist Gerry Lynch who supervised the survey says: "The taking of inventory was only a start. In the next few years we will determine the factors limiting the moose population. A key factor will probably turn out to be access."

Access into formerly closed forests has increased as a network of oil roads and cutlines spreads across the North. This trend can be expected to continue and accelerate in view of the large-scale forestry developments of the present. Hunter mobility has also greatly increased with the proliferation of over-snow vehicles and all-terrain vehicles.

To publicize the results of its comprehensive survey, and to give the public an opportunity for questions, the Fish and Wildlife Services conducted a series of meetings at 25 communities across the province. While demands for wolf control dominated the discussion in Edmonton, the issue that raised by far the most heated comment in rural communities was native hunting.

Native Hunting Rights

Alberta native peoples have rights to the unlimited harvest of game for personal use on unoccupied lands at any time. These rights are enshrined in treaties signed with a representative of the British Crown a century ago. They have been upheld in Canadian courts, when challenged, and are viewed as sacred by native leaders. In comparison, similar treaties were not signed in Alaska, where aboriginal peoples have to follow the same hunting rules that govern white subsistence hunters.

Resentment against unlimited and sometimes wasteful hunting by natives is common in the Alberta hunting community. Feelings can be summed up as follows: It is not anymore a question of the noble savage

Author's guide during a 1961 canoe trip down the Hootalinqua River, Yukon. His rifles included a high-powered one for shooting moose and a .22 for small game. Photo: Dick Dekker with primitive arms against the beast. Our social system gives natives the money to buy cars and guns. Why can't they abide by the rules just like everybody else?

"The issue of native hunting is a very thorny one," admits Brent Markham, Alberta's Assistant Director of Wildlife. "And it is not going to go away very soon."

Speaking on behalf of the Alberta Fish and Game Association, vice-president Andy Von Busse believes that the Indian question is absolutely vital to sound management of moose in this province. The Association has recently begun negotiations with native representatives. "However, even though a band may decide to enact some game management, individuals may still be able to circumvent such an agreement. As the law reads now, accountability can't be enforced."

In the meantime, reacting to the results of the government moose survey, and the modest densities and recruitment figures reported by the survey, the High Level Tribal Council has reiterated its claim that native people need all available game for subsistence, implying that there isn't enough left for sport hunters.

Roger Senecal of the Treaty Eight Grand Council summed up his position in this way: "For natives, hunting for food is a right. Hunting for European settlers is a privilege. Moose are very important because they are one of the main staples for Cree Indians. The hunt is not unregulated; it is regulated by the native communities. This could be enhanced through a regime of co-management with government."

Calls For Wolf Control

In contrast with rural residents who focus particularly on native hunting, Edmontonians tend to direct most of their concern on predation. During a public meeting held at the Provincial Museum in Edmonton, 3 May 1994, a hunter in the audience pointed to a wolf control campaign in Manitoba which purportedly increased moose calf survival from 17 to 70 per 100 cows. Perhaps tongue-in-cheek, he suggested that the Alberta government should quietly commence a poisoning program. "Why don't you just go ahead and tell us about it later. I heard about NovaTel after it happened!"

Lyle Fullerton, spokesman for Fish and Wildlife Services, stated that the Alberta government was committed to maintaining a healthy balance between prey and predator populations in the North. But when questioned further, he admitted: "There isn't the political will in Alberta to control wolves."

Fullerton made the same claim during a panel discussion on wolf management which drew overflow crowds to the Provincial Museum in February of 1990, when he was executive director of the Alberta Fish and Game Association. While Fullerton was in office, the AFGA routinely passed resolutions lobbying the provincial government to "finally do something about the wolf problem".

Female moose with calves Photo: Bill Ivy

The Alberta government prudently did not give in to hunters' demands for wolf control in the 1980s. At that time, aerial kills in British Columbia and Alaska raised a storm of indignation from the general public, generating more letters to government than any other previous issue before it. As a result, neighbouring jurisdictions thought twice about initiating similar programs. The Alberta government disregarded the advice from some of its own specialists who advocated wolf control as "an effective management tool" to increase hoofed mammal populations, particularly Elk in the central foothills and Woodland Caribou in the Grande Cache area.

Alberta carnivore manager John Gunson views wolf control as one of several ways to make northern Alberta into a paradise for large mammals. "Aboriginal people as well as other Albertans would benefit tremendously under a regime of large mammal restoration. Wildlife managers have the knowledge and the tools to modify habitat, to control harvest and to manipulate ungulates and predator populations. Alberta could support a great wildlife industry."

Do Wolves Depress Prey Populations?

Would wolf control actually result in increasing numbers of moose? This question has been debated among field researchers and wildlife managers for decades. The answers vary from "no" to "yes", depending on circumstances.

In some regions where wolf control operations have taken place, moose increased significantly. In other experiments, their numbers did not change much because the major factors holding the moose popuation down were poor habitat, severe winters, overhunting or bear predation.

The mother of all wolf/moose studies, as biologist Victor Van Ballenberghe termed it, took place in the Nelchina River basin in Alaska. Over 150 wolves and 200 moose calves were captured and fitted with radio-collars. The surprising discovery was that the major calf killers proved not to be wolves but bears, particularly the grizzly. During the 1992 North American Symposium on Wolves, held at the University of Alberta, Canadian biologist Francois Messier summed up what was known about moose and predator systems based on 27 studies from across Canada and Alaska. He calculated that moose could increase to 130 per 100 km^2 in the presence of only one predator, the wolf. If the moose productivity was further diminished by poor habitat or by bear predation, particularly on new-born calves, moose density would stabilize at a much lower density of 20-40/100 km^2. This latter scenario appears to be prevalent in most of northern Alberta.

Messier warned that the hunter's share of naturally regulated moose populations should be no more than six or seven percent if further declines were to be avoided. The combination of heavy hunting pressure and predation by wolves and bears would cause moose to drop to less than 17/100 km^2.

In contrast, based on his computer modelling, Messier claimed that moose could increase to 200-400/100 km^2 in the absence of predators. However, the stability of such a system remained unsure. Such high moose numbers might well come tumbling down after severe winter starvation or infestations of winter ticks.

Ticks are a serious health hazard affecting moose, particularly when densities are high. Individual animals can carry thousands of the pea-sized parasites, which attach to the skin, gorging on blood and causing hair loss. In extreme cases the host animal will die.

Without predators, the productive soils of north-central Alberta can support very high densities of hoofed mammals. For example, Elk Island National Park, a fenced oasis of poplar woods near Edmonton, contains 175 moose/100 km^2. Besides a warden-managed inventory of around 350 moose, the 195 km^2 park also contains 1,850 elk, 1,100 bison and 350 deer The total ungulate density is therefore an astonishing 1,850/100 km^2!

Perhaps unfairly, North American hunters are fond of pointing to-the extremely high moose harvest figures from Sweden, where wolves and bears are very rare. Less well-known is the fact that winter ticks are absent, allowing high densities of moose that are closely managed. Each year, Swedes fill their freezers with 120,000-150,000 moose, about the same number as the entire population of Alaska. The northern state is three times the size of Sweden, but Alaskan hunters shoot no more than 7,000 moose per year! In Alberta, half again the size of Sweden, the hunter kill has declined from 12,000 to less than 6,000 moose per year.

Do Hunters Kill Too Many Moose?

The known harvest of moose in northern Alberta amounts to roughly 7 percent of the estimated total population of 81,000. This figure is within the six to seven percent recommended by biologist Messier and should not cause declines, particularly since it involves nearly exclusively bulls. However, the moose-kill by natives and poachers, who take cows and calves as well as bulls, is unrecorded and additive to the legal harvest.

The picture looks brighter in west-central Alberta and the Peace River block, where a substantial amount of excellent moose habitat lies on the margins of agricultural land and grazing leases where large predators are scarce. Roughly within a 150 km radius of Edmonton, as well as in parts of the Edson and Whitecourt regions, and particularly in the Peace River block, wolves are absent or controlled by all available means, including poisons, to protect livestock.

In this vast mosaic of bush, marshes and pasture, local moose densities already exceed 50-70/100 km^2, exposing them to outbreaks of winter ticks. In these semi-wild habitats, and in the absence of nature's own moose manager, *Canis lupus*, Alberta game managers should find an opportunity to show what they can do in the way of boosting the sustained yield of moose for hunters.

As a naturalist and non-hunter, I would like to see moose densities in Alberta forests maintained at fair levels, not just for the benefit of human hunters, but as a food base for the pyramid of predators and scavengers that depend on moose meat and carrion. In my view, some give-and-take between natives and non-natives is also long overdue.

Perhaps there is hope for a workable arrangement in the future. Revolutionary improvement has already taken place in the harvest of Barren-ground Caribou in the Northwest Territories where aboriginal representatives are now full-fledged members of Caribou Management Boards. These boards have been very effective in regulating the hunt and inspire a sense of user responsibility.

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DATES TO REMEMBER January 21 and 22, 1995 ANNUAL GENERAL MEETING

Spring 1994 Raptor Migration in Southwest Alberta

Teresa Dolman

It began innocently enough -- my husband, Doug and I had promised Peter Sherrington we would try to help him track the Golden Eagle migration route through the Rocky Mountains in the vicinity of Waterton Lakes National Park. Starting early in March we began covering a circular route southwest from Lethbridge to Waterton and back. We quickly realized that there were other migrating birds of prey, and soon the route "had" to be covered every week. We did the weekly trip until about the end of April, then went out every two or three weeks until early June. Roughly the same route was covered, with some variations due to weather, road conditions or time restrictions. We attempted to identify every raptor we saw and kept a record of numbers. This certainly was not a scientific survey, and wind and temperatures on "count" days no doubt affected the numbers of birds seen, yet some interesting patterns emerged and are presented here. The accompanying sets of figures show the numbers seen during each week of observation, and the text below points out interesting features for each species.

Golden Eagle: Unfortunately, we failed to find a major eagle migration route in Waterton Lakes National Park. Some birds were seen, but never great numbers. On the other hand, we found a significant number of Golden Eagles migrating throughout the prairies and foothills, and it might be surmised that eventually many of them would make their way into the "pipeline" route in the front range of the Rockies. A large surge of eagles went through during the week of March 21-27, which coincides nicely with the date of peak numbers seen by Peter Sherrington at Mount Lorette in 1993 (Sherrington 1993).

A major surprise was that even in June we were recording a dozen or more eagles on each outing. Beginning in early May we realized that the birds we were seeing were not "in a hurry" to get anywhere (in contrast to the earlier migrants). Some were trending northwestward, but others seemed to be merely loafing. No doubt some breeding pairs took up residence, but we have come to the conclusion that adequate habitat exists in southwest Alberta to support a number of non-breeding eagles.

Bald Eagle: A recent publication on a ten-year study of radio-tagged Bald Eagles notes that the migration route of Bald Eagles wintering in the intermountain states (especially Utah, Idaho and Montana) follows a narrow corridor through southwest Alberta along the foothills; once into Alberta, adult eagles follow a direct route northward (to nest in the Northwest Territories and northern Alberta), while the route of immature eagles is more variable (McClelland et al. 1994). More than 20 years ago Dekker (1970) noted high numbers of eagles migrating in the foothills west of Cochrane, and more recently, records from the Alberta Bird Record also hint at this migration route (Collister 1987; Dickson 1988).

In the study of McClelland et al. (1994) none of 25 radio-tagged eagles crossed the U.S. -Canada border prior to March 15; in contrast, we found migrating eagles even in the first week of March. Dekker (1970) suggests that the migration peaks in mid-March in the Cochrane area. According to our numbers the migration peaked in late March and was essentially over by mid-April in the southwest corner of the province; birds observed after that date were likely breeding in the Waterton/Glacier Parks region. The migration front appeared to cover a 50 km stretch from Del Bonita to Police Outpost Provincial Park and it would require a team of observers making daily observations in order to discover how many Bald Eagles use this migration route. Gerrard and Ingram (1985) state that there are no good estimates of Bald Eagle populations for Alberta or the Northwest Territories.

The Bald Eagles we observed were either perched in trees or on the ground, or they were flying low to the ground. This is understandable in light of McClelland et al. (1994) who state that ground squirrels and sheep/cattle afterbirth constitute an important food source for migrating Bald Eagles.

Rough-legged Hawk: Because many of these hawks overwinter in southern Alberta, the first birds we observed in early March may not have been moving north. Larger numbers in late March hinted that a northward movement was underway, and peak numbers passed in early April. Our high number of 83 on April 10 agrees in date and was comparable to the 110 seen April 17, 1987 near Calgary (Collister 1987). Pinel et al.(1991) report the peak of migration to be from the end of March to mid-April.

Of all the buteos we saw, the Rough-legged Hawk was by far the most numerous, and its distinctive plumage pattern made the birds relatively easy to identify even at great distance. They migrated on a very broad front, everywhere except in the mountains. It is difficult to say whether the numbers we saw were normal; however, there certainly were more than we had seen in any previous year, and there were reports in the press of a scarcity of rodents further north, which may have sent unusually large numbers south last winter.

Red-tailed Hawk: This species arrived in southwest Alberta the third week of March, and numbers rose each week until mid-April. This pattern agrees with that stated by Pinel et al. (1991). Because many of these birds remain to nest in the region, numbers did not drop steadily as with the Rough-legged Hawk. Actually, the number seen in June was not all that many fewer than in April, suggesting that either we missed many migrants, (by late April there were many buteos flying too high to be easily detected or identified), or they followed a route that did not intersect ours.

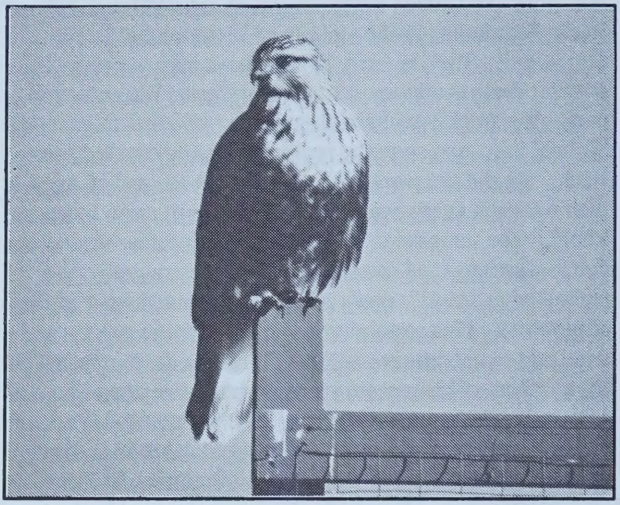
Ferruginous Hawk: Again in agreement with Pinel et al. (1991), this species arrived in late March. Because of the low numbers no generalization can be made regarding migration pattern. Nesting birds were observed later in the season, and perhaps most of the birds seen were resident rather than migrants.

Swainson's Hawk: As expected, Swainson's Hawk was the last buteo to arrive. In fact, for some reason its arrival may have been delayed, as previous records indicate a late March to mid-April arrival (Pinel et al.1991). However, when it did arrive in the third week in April, it did so with a bang (23 on April 2; 46 on May 1). As with Red-tailed Hawk, it is unknown whether the drop in numbers in June is due to the fact that migrants had passed on, or whether resident birds were "dropping out" to nest.

Northern Harrier: The first Harriers arrived about a week later than suggested by Pinel et al. (1991). Both Dickson (1988) and Pinel et al. (1991) record peak migration of this species in mid-April. Our numbers indicated a peak migration sometime between the third week of April and the first week of May, although again the picture is complicated by the fact that this species breeds locally. We agree with Beebe's observation (1974) that during migration Harriers often fly as high as buteos.

Short-eared Owl: Along with Rough-legged Hawks, many Short-eared Owls took advantage of the abundant vole population in southwest Alberta this past winter and overwintered here. However, our numbers showed a dramatic increase in early April, which agrees with the observation of Pinel et al. (1991) that the first migrants arrive in late March and early April. In mid-April, 1987, 114 Short-eared Owls were seen southeast of Calgary (Collister 1987). The 40 we counted on April 1 were all southwest of Lethbridge on the Blood Indian Reserve. The actual number of birds was undoubtably higher, as it was dusk by the time we arrived there, and we felt we could not safely continue to make frequent stops along the narrow highway.

Summary: The species discussed above are only those we saw in any great numbers, but additional raptor species we recorded were: Snowy Owl, Great Horned Owl, American Kestrel, Merlin, Prairie Falcon, Gyrfalcon, Sharp-shinned Hawk, Cooper's Hawk and Osprey. We made 13 round trips, logging approximately 3600 km (astonishing how the clicks add up!). From early March to mid-May in southwest Alberta there was a steady procession of migrating raptors, beginning with Bald and Golden Eagles and ending with Swainson's Hawks. The eagles and Rough-legged Hawks, in particular, passed through this region in impressive numbers.



Rough-legged Hawk Photo: T. Dolman

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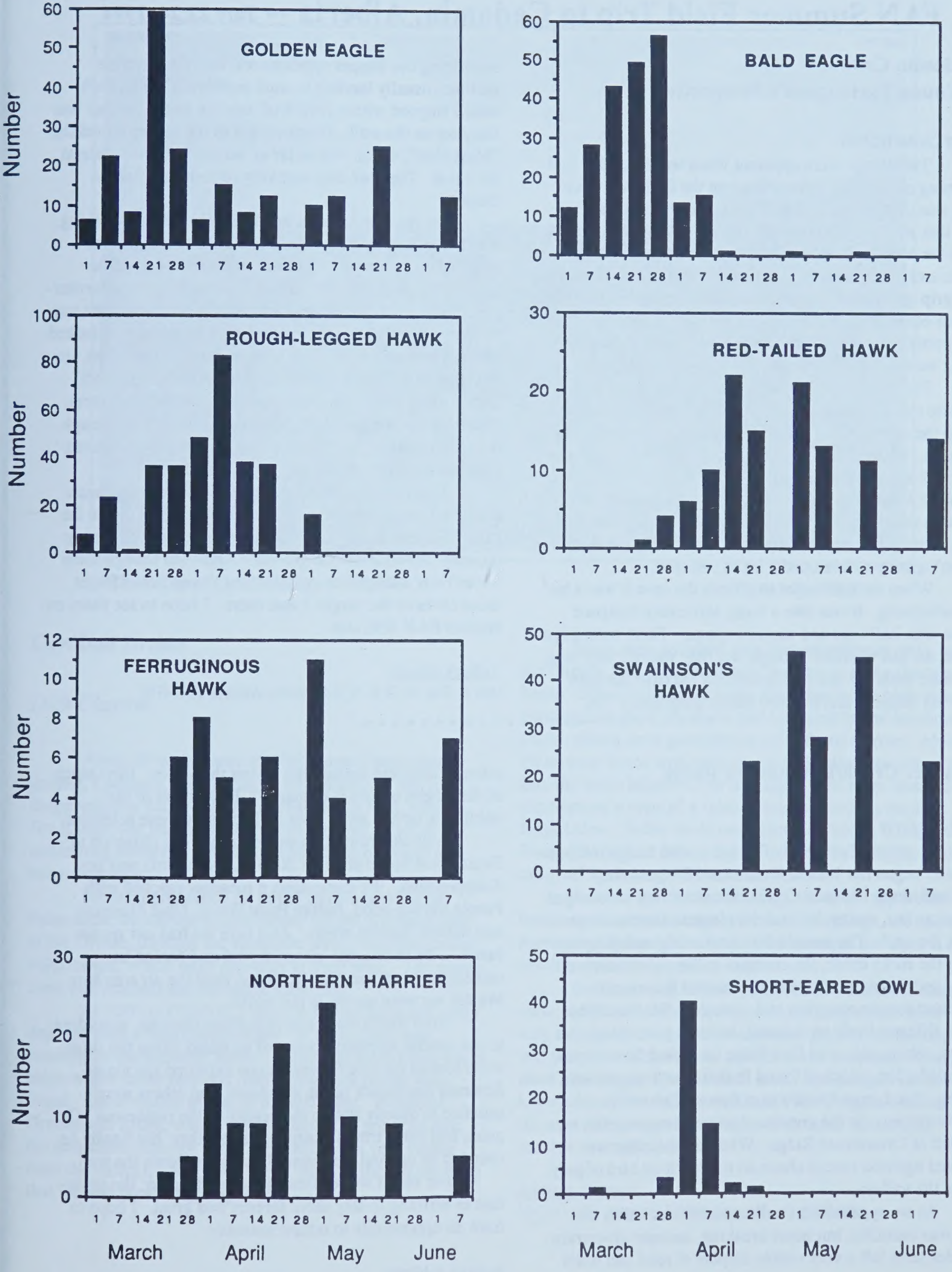
GOLDEN EAGLE
BALD EAGLE
ROUGH-LEGGED HAWK
RED-TAILED HAWK
FERRUGINOUS HAWK
SWAINSON'S HAWK
NORTHERN HARRIER
SHORT-EARED OWL
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FAN Summer Field Trip to Cadomin, Alberta -- July 23,24, 1994

Cadomin Cave - A Young Participant's Perspective

Lisa Semenchuk

Two things were apparent when we assembled that morning on July 23, 1994 to explore the Cadomin Cave. One was that we were all still a bit asleep and the second was that we were ready for adventure. We were equipped with the necessities for spelunking: flashlights, sturdy shoes and hardy lunches. The more experienced of us also had grip gloves and coveralls. For the trip up to the cave, all our equipment was packed in backpacks. My backpack was pretty light, but other people who had their families along were not quite so lucky.

The walk up to the cave was not very long, but because the slope was steep, it took me nearly an hour to get to the cave mouth. When I got there, there were only six of us. More than half of the group had taken a wrong turn and had climbed the neighboring ridge. We waited for about an hour and a half for the rest of the group to reach the cave entrance. An hour and a half is a long time to wait, especially when you are 14 years old like me, and haven't quite yet developed a lot of patience.

When we finally got to go into the cave it was a bit overwhelming. It was like a huge, intricately designed house with hallways and massive rooms. There were a few places we had to crawl through, but they weren't very long and were quite far apart. Throughout the cave the floor was very slippery and in some places quite steep. So, sacrificing our dapper appearances, we slid down the inclines, usually landing in mud puddles. On one such slide I stopped within inches of running into a bat that was hanging on the wall. When we got to the cavern called the "Mess Hall", which was as far as we could go, we stopped for a rest. The cool cave was very refreshing after the descent.

On the way back up my flashlight stopped working, which was a little tricky, since one of the passages had hundred foot drop-offs on either side which I could no longer see. But with the help of one of my fellow adventurers who was in front of me, I managed quite well. The new perspective which the ascent gave was incredible. It looked like a whole new cave. The inclines we had slid down, we now had to wriggle up through. The passages that had gotten wider now grew more narrow as we went up them. The most sensational sight, however, was the sky through the cave mouth! The brilliant blue sky greatly contrasted with the murky cave interior.

Upon setting foot in the sunshine, everyone began taking off the sweaters and coats they had worn inside the cave. The trip down the mountain was much like the trip up, only this time no one got lost. And even though there weren't any stalagmites or stalactites, I won't ever forget those caves or the people I met there. I hope to see them on another FAN field trip.

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* *

Prospect Creek/Drummond Ridge

Ann Stefura

A group of about 15 of us led by Jim Lange, enthusiastically began our hike to Drummond Ridge at the trailhead along Prospect Creek. We were very encouraged by the perfect, sunny day and the pleasant surroundings along the trail. The sound of water flowing and skipping along the rocky creek, the constant calling of a variety of birds, and the sight of strikingly colorful flowers all competed for our attention and curiosity. We identified many different birds on the trail, including warblers, juncos, robins, etc., and Don Stiles identified flowers and compiled a list, which is found in this issue's supplement section. Jim Lange found a rare flower (*Telesonix heucheriformis*) in the crevice of an overhanging rock on the cliff of Drummond Ridge. While on the ridge we watched agitated ravens chase an unidentified bird of prey across the valleys.

As we approached the Prospect Creek valley the view was beautiful, but heart-breaking, because all-terrain vehicles have left a very visible display of road and trails crisscrossing and zigzagging across the valley. How much of the fragile terrain is damaged? How much of the wildlife is turned away from its habitat by these activities?

With determination we continued our climb up to Drummond Ridge at about 2040 m. Our efforts was not disappointing. We came upon a meadow patched with Purple Monks-hood, Indian Paint Brush, Blue Fleabane and daisies, among others. And here we had our picnic lunch. The occasional breeze stirred and cooled us, causing us to realize how fresh and pure the air was here. We felt we were on top to the world.

After lunch we began to explore the area, according to our special interests. Some of us hiked along the ridge; some looked for rare flowers; some explored the many-flowered patchwork of the meadows; and others were satisfied to quietly absorb the beauty of the panorama. Our guide had some trouble keeping us together, but finally he rounded us up, and we began the descent down the trail.

For me, it was difficult to leave the area; the sensation of wanting to stay there forever was great. I hope to have an opportunity to return someday.

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The Prospect Creek Valley

Photo: Pat Clayton

Cardinal Divide

Dick Clayton

About 30 people met at Whitehorse Creek campground, Cadomin, on a perfectly fine morning. We reduced vehicles and went south to Mountain Park, where Jim Lange, our leader and expert in the area, gave us interesting historical information about the old town and mine workings.

We then proceeded on to the Divide parking lot. From there we started to hike slowly up the northeast side of the Divide, through the subalpine forest, enjoying many wildflowers, which were probably at their peak. The alpine zone was reached and the ridge soon after.

At 2200 m (7200 ft.), there is a long ridge and steep drop-off with a magnificent view. A Mule Deer was relaxing in the meadow below. Along the ridge there was a ledge where some rare and interesting rock plants were found. Some visible points of interest were: Prospect/ Drummond Ridge, where we had hiked the previous day; the new mine clearing above Mountain Park (not visible from the valley); and a "bird's-eye" view of the old townsite that we had previously inspected.

Some were satisfied with this exceptional vista, had their lunch, and returned below in order to make the trip home. Others proceeded along the ridge to the high point, viewing carpets of Fleabane and Larkspur in the meadows below, which were patrolled by a Northern Harrier. Many Pikas were heard with their alarm calls, and seen scurrying into the rocks below. Over the edge of the ridge some of us experienced a view of a relaxed marmot resting on the ledge below. A few birds were seen, including Common Raven, Dark-eyed Junco, Say's Phoebe, Water Pipit, White-crowned Sparrow and American Robin.

It was a hot day for walking, but at the top a cool breeze came over the edge. Eventually, though, we had to leave the ridge and hike back down through the trees, a much warmer proposition.

Everyone was certainly impressed with the fantastic view and the wildflowers, with not too long a hike for a very satisfying time. The educational purpose of the trip was to update members on aspects of the proposed Management Plan for the Coal Branch area. Jim Lange's intimate knowledge of the area has assisted FAN's representation on the area's planning committee, which must reconcile a number of conflicting uses.

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Alberta's Natural History Review

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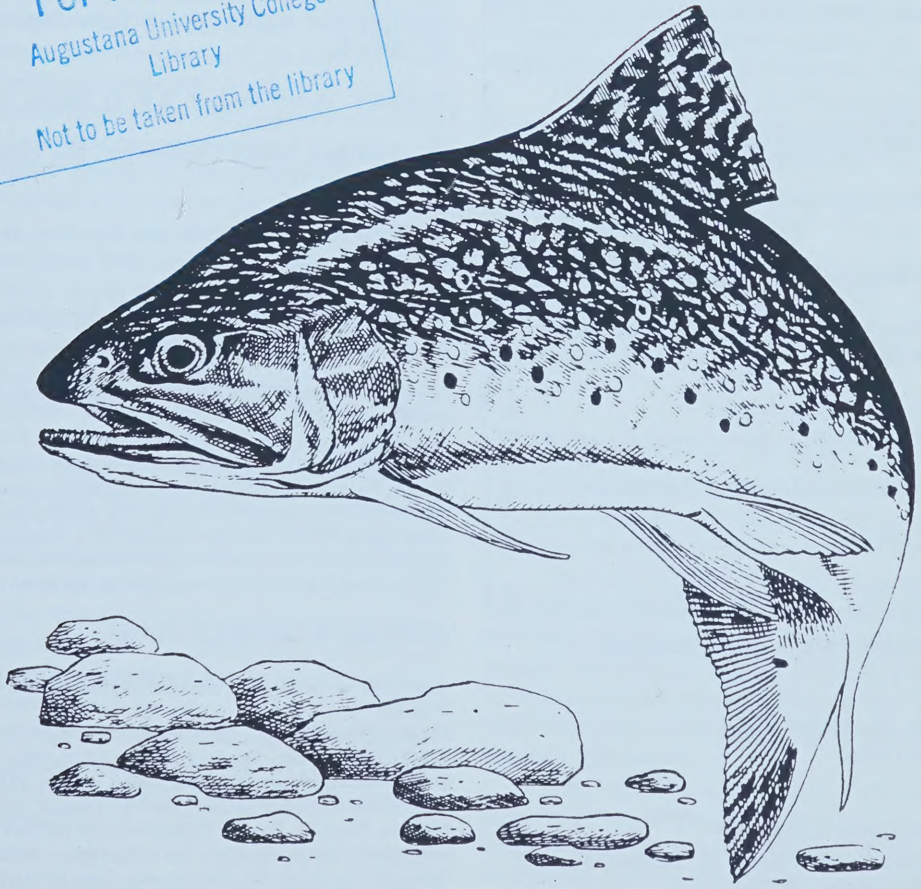

Alberta's Breeding Bird Survey - Red-tailed Hawks in Combat - Bird Checklist Program
Alberta Issues - Fish and Wildlife Trust Fund - Water Quality of Alberta Lakes
Endangered Species Legislation - Prairie Conservation Plan
Prairie Nest Box Program - Snowy Egret

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CONTENTS

President's Page 63

Editor's Page 64

What Was That! 64

Hey Buddy, Can You Spare The Time?
Motivation and the Breeding Bird Survey Participant in Alberta,
Dave Ealey, Brenda Dale, Ross Dickson and Jack Park 65

Red-tailed Hawks in Mortal Combat, Earl Stamm 70

Alberta Bird Checklist Project, Glen Semenchuk 71

Alberta Issues 72

Supporting our Wildlife:
Alberta's Fish and Wildlife Trust Fund 74

Alberta Lakes: A Perspective On Water Quality,
Patricia Mitchell 75

Update: Proposed Federal Endangered Species Legislation 76

After the Action Plan - What's Next for Prairie Conservation?,
Elizabeth Saunders (Savoy) 77

The Prairie Nest Box Monitoring Program,
Ted Code and Louise Horstman 80

FAN Meeting and Field Trips in Stettler, Carol Simpson.......... 81

Snowy Egret, Phil Boston 82

Announcements 83

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Deadlines for FAN project reports are:
Alberta Christmas Bird Counts; January 30, Andrew Slater, 152 Oakside Circle, S.W., Calgary, AB T2V 4H2.
May Species Count for Birds and Mammals: July 15, Curtis Pollock, Box 776, 100 Mile House, B.C. V0K 2E0.
May Species Count-Plants: July 15, J. Derek Johnson, Northern Forest Centre, 5320 - 122 St., Edmonton, AB T6H 3S5.

Compiler cooperation is greatly appreciated.

Honorary Member: Professor W. Ray Salt

Patron: Hon. Dr. J.W. Grant MacEwan

The Federaton of Alberta Naturalists is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views between natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or orther features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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President's Page

Harvey Gardner

Recently, FAN took part in an ERCB hearing *in support* of an application by Shell Canada (see Carbondale Pipeline Project under "Alberta Issues").

FAN's land use chairman, Maryhelen Posey, and I agree that sour gas wells are safer in production than ''shut in'', partially due to more active supervision. The fact is that the proposed pipeline will follow existing rights-of-way and other disturbed areas (seismic lines, truck roads). At the present time the roads to the well sites are still in place, and other roads (some used in logging) and seismic trails afford uncontrolled motorized access to the area.

An undertaking by Shell to upgrade the existing informal track, and close it to motorized access other than that of Shell and a local landowner, would reduce random access. Other road gates used by Shell that I have witnessed seem to have been successful, and are all but impossible to bypass, except on foot or horseback. When the gas has been extracted and Shell has no further use for the pipeline, it will be removed and the road reclaimed and permanently closed. This would be a long term, permanent improvement to a potential wilderness area scarred by industrial and recreational activities, and it would be at no direct expense to Alberta taxpayers. A brief discussion of this position was approved by the FAN board of directors.

Some individuals from another environmental group have taken exception to our position on this application, as have some others in the past when I did not oppose (or support) other applications when it seemed more fruitful to try for a position of guidance input. Maryhelen and I feel that we would rather oppose applications (e.g., Amoco in the Whaleback) where previous disturbance has been minimal and/or the company has a poor environmental reputation, rather than those in more disturbed areas (one mile or more road access per mi.) and where the company is making an attempt to be environmentally responsible. In short, I don't see any sense in beating up equally those who are making attempts at doing the right thing and those who make no effort at all. Shell's application on the Carbondale pipeline was actually less than perfect and many minor deficiencies were uncovered and brought out by intervenors at the ERCB hearing. That's fair ball, and deficiencies should be pointed out, even if the applicant thought they were no big deal. The ERCB may very well use these deficiencies in making conditions for approval of the application.

Several other companies in the oil patch are also making some effort to behave themselves, and although I don't foresee supporting applications, perhaps the companies will accept help in avoiding pitfalls. Maryhelen is in touch with several companies operating along the foothills of the Eastern Slopes.

It is difficult to walk the tightrope of reason. None of us really wants to look at, or listen to, industrial development in unpopulated areas. Many of us want to be able to travel to an untrammelled area and enjoy scenery and wildlife undisturbed by contact with fellow humans. We all need to know that wild creatures from grizzly bears to salamanders remain secure in their habitats.

Yet others seem to feel that it is desirable to ''progress' with development--to clearcut log absolutely anywhere, expand skiing opportunities in Banff National Park, expand golf opportunities in Kananaskis, pave nature trails, and allow highway development through Calgary's parks. So many battles, so many issues, so few resources available to naturalists and environmentalists.

Even with the livestock industry (where I work) there is controversy regarding the problem of major carnivores. A few stockmen still believe that the only way for their herds to be safe from carnivores is to eliminate the predators. Others of us are certain that management practices can lessen or eliminate predation problems. Most people in our industry fall on some sort of bell curve in between these positions.

I feel it is dangerous to assume a rigid stance in regard to any activity lest we overstate our case and wind up trampled by a population majority afraid that its physical comforts might be threatened.

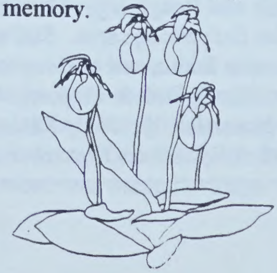
* * * *

In Memoria
R. Barry Jenkins
1946 - 1994

Barry, who was President of FAN, 1991 1993, passed away December 6th, 1994, after a two year battle with cancer.

We will all sorely miss our good friend Barry, who cheerfully shouldered the FAN presidency, and sternly defended the Wagner Bog Natural Area. I treasure the memory of sitting around a Blairmore fireplace with Barry and a few others, as he recounted a few tales of his experiences and observations while doing land assessments. Barry was always kindly and helpfully informative.

The "natural history" world of Alberta is much the poorer with Barry's passing although we are grateful for the time he did spend with us. I believe that the 25th Anniversary Special Issue of the Alberta Naturalist will be dedicated to Barry's memory.



Editor's Page

Welcome to a new year! This year, 1995, marks the 25th anniversary of the founding of FAN. In 1968, Ian Halliday, then President of the Calgary Bird Club, and J. Cam Finlay, President of the Edmonton Bird Club, both wrote letters to Dr. Tim Myres of Calgary, supporting his idea of forming a provincial organization to give naturalists a stronger voice in the province's environmental affairs. After receiving these encouraging letters, Dr. Myres contacted the seven naturalist groups then active in the province to see whether they agreed with the principle of forming a federation. Most of the groups did, and, in April 1970, the inauguration meeting of the Federation of Alberta Natualists took place. Six naturalists' groups were represented at that time.

Today, FAN is a federation of 12 active clubs plus several associate members, and it plays an important role in environmental conservation in this province. It represents naturalists on several provincial advisory committees and acts as an intervenor at environmental hearings. It is a clearing house for environmental information, publishes environmental education materials and, since 1971, a quarterly magazine--the *AN*. FAN provides grants to its member clubs for local activities and also undertakes co-operative natural history projects, such as the Bird Atlas and the new Alberta bird checklist program. It also coordinates and publishes provincial Christmas bird counts and May species counts. The Federation also recognizes the special contributions of individual naturalists through its annual Loran L. Goulden awards.

In celebration of its 25th anniversary, FAN hopes to publish a special issues of the *AN* -- to include histories of each of its member clubs, plus a history of FAN itself, its projects and officers. Special Issue No. 1 of the AN was devoted to the first 10 years of FAN's activity; the new special issue will cover the last 15 years, 1980-1995. This special issue will be dedicated to the memory of Barry Jenkins, past-president of FAN, who regrettably passed away this December.

In the current issue of the *AN* we have an intriguing article by Dave Ealey on Alberta's breeding bird surveyers; also updates on the Prairie Conservation Plan (by Elizabeth Savoy), the Prairie Nest Box Monitoring Program (by Ted Code and Louise Horstman), and the federal government's plans to develop new federal endangered species legislation. Patricia Mitchell, editor of the *Atlas of Alberta Lakes,* has contributed an article on water quality of Alberta lakes, and Glen Semenchuk an article on the Alberta bird checklist program. We also have photos of Red-tailed Hawks in combat, and a wandering Snowy Egret in Bonnyville.

Best wishes for your new year!

R. Edrea Daniel

What Was That!

As always, the birders in the Medicine Hat area have been very active. Lloyd Bennet recorded one to four White-faced Ibis in the Taber area until September 27. Earlier in the year, Lloyd had a Sharp-tailed Sparrow in his backyard. Joanne Taylor reported a Harris' Sparrow in Medicine Hat on September 29. Phil Horch had a late record of a Common Nighthawk at Police Point Park on September 21. Phil also reported an irruption of Blue Jays in the Medicine Hat area this fall and early winter.

Members of the Peace Parkland Naturalists have had a number of interesting sightings in their area. *The Hooter* reports that Dave Watson spotted an egret near Woking. Joyce and Jack Mann videotaped a Stellar's Jay in Grande Prairie. Joan Kerr recorded an American Crow and a Merlin on November 9, a Dark-eyed Junco on November 18 and a Bald Eagle and Rough-legged Hawk on November 29 in the Beaverlodge area. She, along with Marie Cliff and Jeanne Smith, saw a Three-toed Woodpecker and a Pygmy Owl on Highway 40 toward Grande Cache on November 17. Andy Raniseth sighted a Brewer's Blackbird at Rycroft on November 30.

The Lethbridge Naturalists' Society reported its May species counts for Lethbridge, Waterton Lakes, Cardston and Claresholm. For the first time the Lethbridge count recorded Hooded Merganser, Rough-legged Hawk, Virginia Rail and Golden-crowned Kinglet. Cardston added five new species, and possibly a sixth. The Field Sparrow was added mainly on the evidence of song. This species is known from north-central Montana and so could conceivably be in southern Alberta. In the Claresholm count two new species were added: Rough-legged Hawk and Water Pipit.

The hotline at the Wildbird General Store in Edmonton has received several interesting sightings, including John Acorn's sighting of a Turkey Vulture in Edmonton Lynnwood on December 2. He also recorded five swans at Wabamun Lake on December 8. Jim Lange reported both a Black-backed and a Three-toed Woodpecker at Cross Lake on December 11.

Hey Buddy, Can You Spare The Time? Motivation and the Breeding Bird Survey Participant in Alberta

Dave Ealey[1], Brenda Dale[2], Ross Dickson[2] and Jack Park[3].

Introduction

In an earlier article about the Breeding Bird Survey (BBS) in Alberta (Park and Ealey 1993), some follow-up articles about other facets of this success story were promised. Now, 1/10th of a decade later, you can learn more about that not-so-rare breed, the BBS participant!

To recap the previous article, the BBS has been conducted in Alberta for over a quarter of a century. The volunteers that take part have spent countless hours conducting these roadside surveys for birds, primarily for songbirds. Through the efforts of many, Alberta has become known as something of a success story for the relatively high number of routes (77 assigned in 1993) that are annually covered throughout the province (map included in Park and Ealey 1993). The total number of completed routes in 1993 was 65, which was second only to Ontario (67).

Improvements and greater coverage are possible, but only if everybody involved learns more about who the current participants are, what problems arise, what motivates these individuals and what can be done to recruit new participants. Consequently, we conducted a questionnaire survey in December 1993 to get some answers. All active participants (58 individuals) in Alberta's BBS were contacted, most by telephone. The Canadian Wildlife Service supplied resources for preparation, implementation and analysis of this questionnaire survey, which is part of a review of the BBS across the prairie provinces.

The questionnaire consisted of 50 questions aimed at filling the information gaps identified. *We would like to thank all participants for responding*--100 percent of Alberta's active BBS surveyors answered our questions. A selection of the results are included in this article, but a more comprehensive report is planned by Brenda Dale to compare questionnaire results from all three prairie provinces.

All BBS participants were asked the same general questions, but additional questions were asked of participants who did more than one route. Thirteen people conducted two or more surveys in a year; the most routes completed by a single person in one year on a regular basis was four. Therefore, for some questions there were 58 responses; for others, up to 77 responses; and for others, multiple responses were possible.

Who Are These Guys?

As indicated in Park and Ealey (1993), most of the BBS participants in Alberta have been males (16 percent have been females), which reflects the situation in birding organizations throughout North America. Age of participants ranged widely, with most being 46-55 years old (Figure 1).

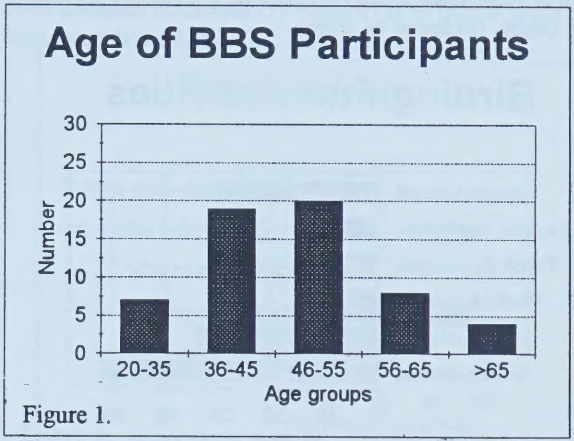


Figure 1.

An almost equal number were in the 36-45 age bracket, which is an encouraging sign. Indeed, nearly half of the BBS participants who conducted more than one route a year were 36-45 years old (Figure 2).

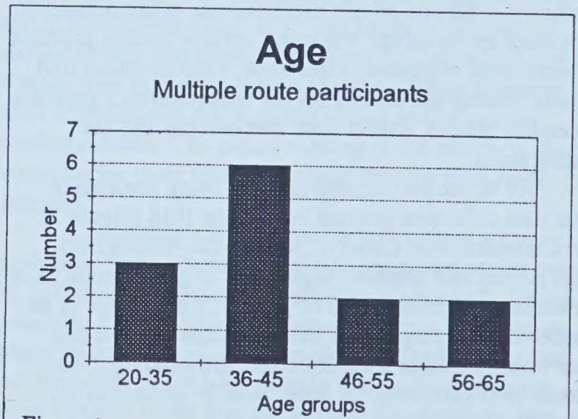


Figure 2.

Younger participants, in the 20-35 age bracket, accounted for only 12 percent of the entire paticipant group, but did make up nearly a quarter of our multiple route participants.

Quirks and Larks

We also wanted to know a bit about the character of BBS participants and how that might differ from the nature of the remainder of the birding community. No, we weren't interested in their strength of moral character or any unsavoury behaviour--we wanted to know what kinds of birding activities motivated the typical BBSer. What we found was a broad diversity of interests, a keen desire to participate in meaningful birding activities and a tendency to enjoy birding alone (solitary birding), for a variety of reasons.

In response to our initial question about what types of birding activities they considered fun, our participants focused on solitary birding, group birding and species counts (Figure 3). Over half of the BBSers took part in each of these three kinds of activities, but solitary birding was clearly preferred by many.

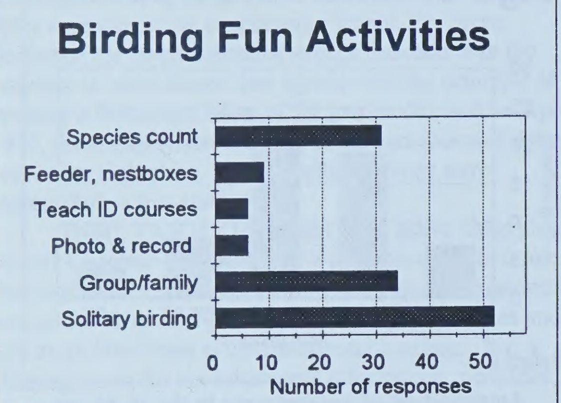


Figure 3.

Solitary birding (Figure 4) just seemed to be more enjoyable for the sheer quality of that type of birding--perhaps it's the one-on-one exclusiveness of the connection with other living things. For some, solitary birding provides a special kind of outdoor experience, whereas others find solitary birding worthwhile for the opportunities it provides to conduct studies, collect data, and develop and use birding skills.

All of the participants reported being involved in other data collection projects besides the BBS (Figure 5). The Christmas Bird Count (CBC) and the Alberta Bird Atlas project had similarly high levels of participation from the BBSers, 69 percent and 62 percent, respectively. A fair number also participated in data collection projects that were work-related or included some bird banding. Nest records were completed by fewer than 20 percent of the respondents.

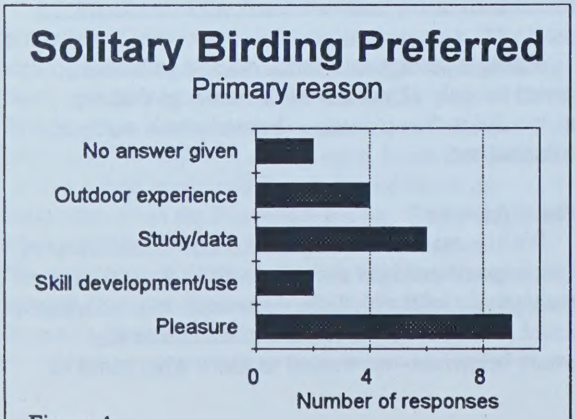


Figure 4.

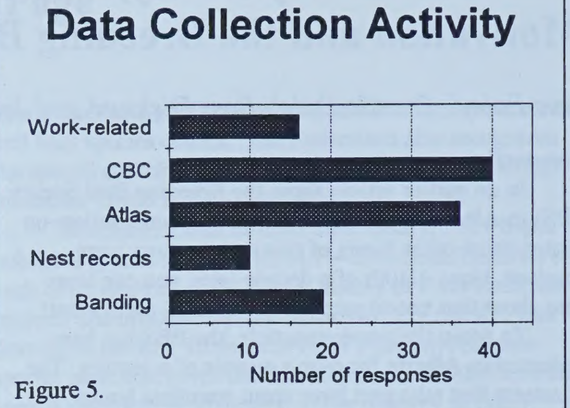


Figure 5.

It Just Doesn't Get Any Better Than This

What is it about the Breeding Bird Survey that keeps these birders coming back year-after-year? The answers we received were diverse, but could be grouped into some intriguing categories (Figure 6). Although enjoyment of the BBS experience was important to a few, this aspect was clearly not enough to keep the majority interested for the long term.

Three types of answers revolved around the benefit of the BBS to personal development as a birder--being able to make annual data comparisons, learning the birds that frequent an area better, and providing an excuse and a means to develop one's birding skills. Similarly, three types of answers focused on the benefit of the BBS to the birds themselves and to those individuals that study and manage birds--provide useful data, increase scientific knowledge, and help in the conservation of birds.

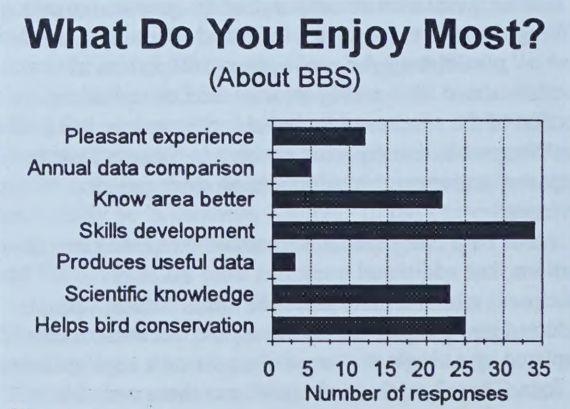


Figure 6.

It's clear that participants must be able to see some value, either personal or societal, in the BBS for it to be successful. And certainly several have committed a great number of years to the BBS--seven participants have conducted surveys for over 20 years (Figure 7).

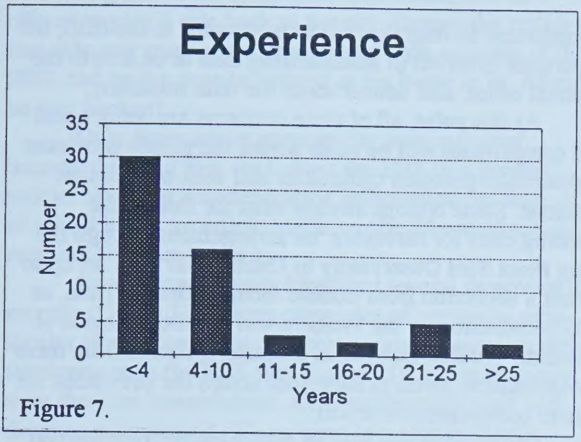


Figure 7.

Planning and Pitfalls

To conduct a BBS survey route, Alberta participants have to do some planning and preparation; some do more than others. Most of the routes are more than an hour's drive from home for our surveyors (Figure 8). Sixteen percent are more than 3 hours drive from home.

Given that surveys begin at anywhere from 3:52 a.m. to 5:00 a.m., depending upon where in the province the route is located (see Figure 1 in Park and Ealey 1993), the surveyors must decide whether to drive extended distances at that time of night or to choose overnight accommodation closer to the start of their routes. Half of the participants reported that they drove directly from home to their routes; not surprisingly, most were going to routes that were less than an hour's drive away. The other half chose overnight locations closer to the start of their routes; 68 percent camped, 22 percent spent the night in a motel and 11 percent stayed with family or at a holiday home/cottage.

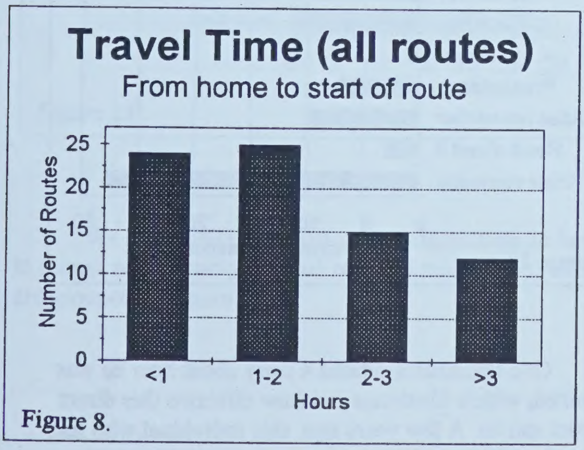


Figure 8.

Each survey lasts around 4 to 5 hours, during which the typical BBS participant in Alberta may detect, during his 50 three-minute stops, up to 100 species including several hundred detections by sight or sound. This type of birding is intensive and requires quick, accurate identification, careful recording of data on the data sheets and careful driving from stop to stop so that the route is completed safely. One major help is to have an assistant to share the tasks; only 18 percent of the routes were ever run entirely alone.

In addition to an assistant, our provincial participants have several techniques to make themselves more effective at conducting their surveys (Figure 9). The most common technique (79 percent) is to review tapes of bird songs beforehand.

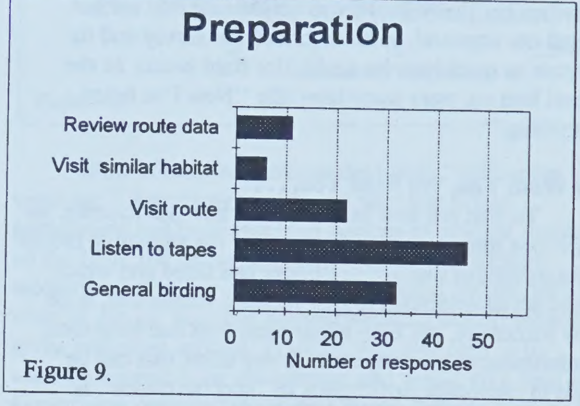


Figure 9.

Fewer than half of the participants visited their route before the day of the actual survey and certainly the more distant routes would suffer because of the difficulty of making the extra trip. This approach of visiting the route ahead of time was found to be less likely to be done by surveyors who had conducted the survey for several years. Taking trips to similar habitat enabled BBSers to renew their identification skills, as did taking part in general birding sessions. The actual running of the survey is likely smoother for those that review past data for their routes (19 percent).

Conducting a BBS survey is not without some problems. Forty-one percent of Alberta routes are reported by participants to have some problem (Figure 10), though generally these problems occurred at only a few stops or along relatively short stretches of road. Traffic noise and the frequency of vehicles passing the roadside surveyor were grouped as the biggest problem the surveyors face.

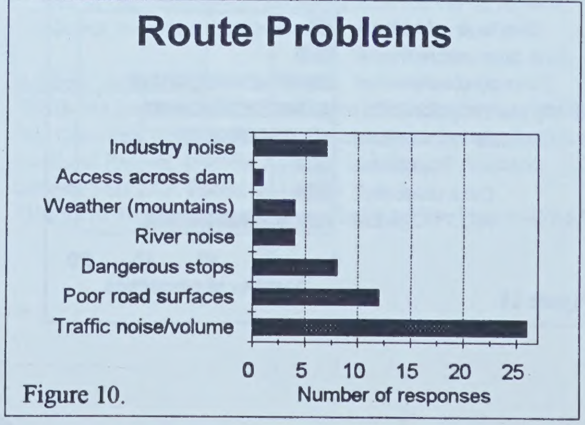


Figure 10.

Dangerous stops affected 11 percent of the routes, primarily those in the foothills, where winding roads made the roadside surveyor difficult for other traffic to detect.

Several participants reported incidents that didn't qualify as "problems," but illustrate how non-participants view this roadside birding survey activity. One BBSer related the tale of the "Farmer's Wife" who refused to believe what he was doing at that time of the morning in front of her homestead. Of course, our surveyor was on a tight schedule to finish his survey, so he was eager to convince her that what he was conducting was neither illegal nor immoral, so he described the survey and its purpose as quickly as he could. Her final words, as she waved him on, were something like "Now I've heard everything!".

We Want You, We Need You, . . .

To find out how best to recruit new participants, we felt it was important to discover all of the stumbling blocks or aggravations that active BBSers had faced and which might act as deterrents to new recruits. Remember, to be truly successful, the BBS needs consistent and long-term commitment to a survey area, so any effort that can be made to encourage participants to "stay the course" is worthwhile.

A quarter of our 58 active surveyors claimed that they had no difficulties or complaints about the BBS as a survey or in terms of their involvement with it (Figure 11). For those who did have criticisms, the most frequently mentioned ones dealt with dislikes about the actual format of the survey, all of the rules that one has to follow and the limitations imposed by having to conduct the survey under specific weather conditions (28 percent). The early start and physical effort were reported as concerns for a quarter of the surveyors and only marginally less frequent were concerns about the distance to route and the costs involved (gas, lodging, etc). Minor concerns included shortage of helpers to assist in the running of the survey, the time commitment in June that has to be devoted to the BBS, the paperwork involved in summarizing data to be sent to the national office, and doubts about the data reliability.

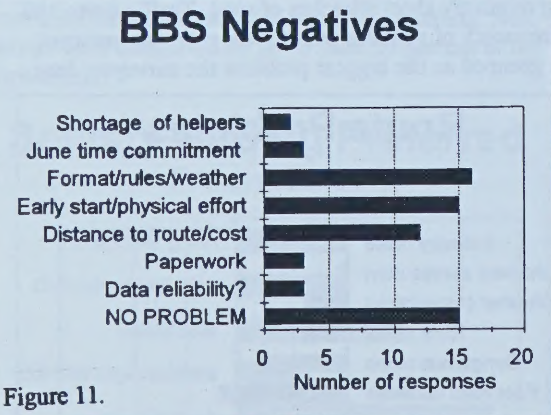


Figure 11.

At this point, all of these concerns are being noted and comparisons will be made across the prairie provinces to determine common difficulties and seek out possible solutions. Some options already exist for things like reducing costs for surveyors; an arrangement through the Long Point Bird Observatory in Ontario has been set up to permit a deduction from taxable income. Brenda Dale, as BBS coordinator for the Western and Northern Region at Canadian Wildlife Service, is examining results from these questionnaires, given to surveyors across the provinces, for a more comprehensive report.

We felt that one way to determine the best method to recruit new BBS volunteers would be to find out what worked in the past. There were several approaches that seemed to work (Figure 12), but nearly half became involved because they knew someone who was already doing a BBS route.The next largest category was 17 percent being recruited through the Alberta Bird Atlas Newsletter (Ealey 1991). Certainly, that appeal was effective primarily because it piqued the interest of birding enthusiasts at a time when they had just completed a major birding project and were looking for something new to do. Such opportunities to reach out are rare, but when they occur, they should be pursued. Direct contact by the provincial coordinator (Jack Park), as well as presentations, were also reported to be significant recruitment methods.

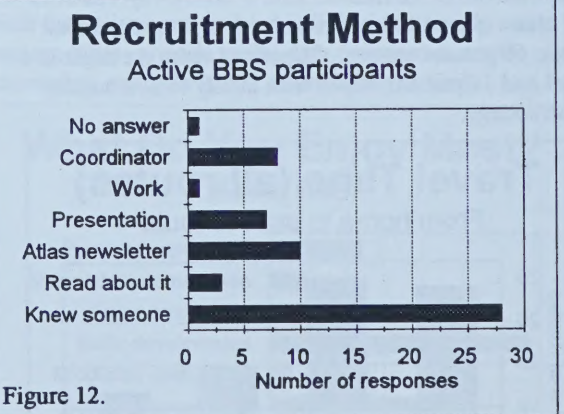


Figure 12.

One respondent related a story about how he was recruited, which illustrates just how effective this direct contact can be. A few years ago, this individual,who had been a long-time participant in birding activities in the Edmonton region, was taking part in a Christmas Bird Count at Wabamun Lake. A birding partner developed problems with his car, and so our unsuspecting birding enthusiast was stranded. Along came Jack Park, who was also taking part in the Christmas Bird Count, and he offered to give a ride back to the city. During the course of that ride, our respondent was regaled with accounts of the BBS, and by the time he arrived at his home in St. Albert, he was hooked!

Only three active participants were recruited because they had first read about the BBS in a general article. Now that was depressing information for those of us who felt that an article might be effective at attracting recruits! (But see below.)

Current participants identified several deterrents to recruits (Figure 13). Three categories of responses were similar to criticisms that participants made regarding their involvement in the BBS (see Figure 11). These concerns were the time commitment, format/rules/early start and distance to route/cost. There were two closely related deterrents: the uncertainty and intimidation that novices might feel toward such demanding birding as the BBS and the perceived skill level that must be achieved before surveyors can be effective at running a BBS route. Our questionnaire respondents also noted that inadequate publicity about the BBS is a minor deterrent. Another minor deterrent was a lack of interest among some skilled birders who don't wish to conduct surveys under the strict rules required by the BBS approach.

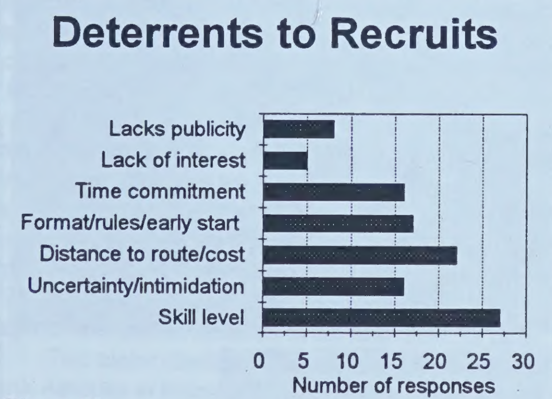


Figure 13.

We asked BBS participants for suggestions on how to recruit new participants and received many ideas, which are grouped in Figure 14.

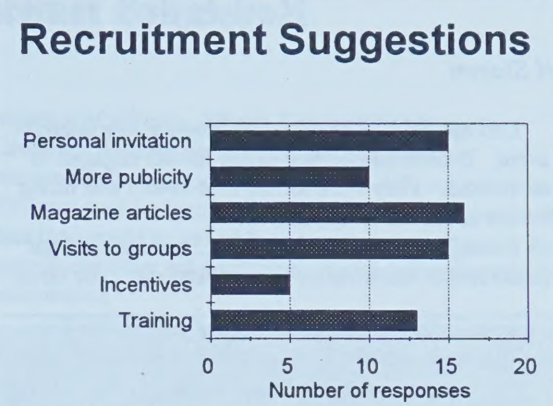


Figure 14.

Most of these suggestions deal with "getting the word out." Surprisingly, although very few active participants had been recruited because of general articles on the BBS, the use of magazine articles was strongly recommended by our respondents. Personal invitations and visits to groups were two approaches with similar support to the magazine articles. Training was also seen to be a valuable approach for recruitment and would go a long way to resolving concerns about skill levels. Incentives were not considered to be very important as ways to recruit new participants, but for some potential recruits even minor incentives could be effective.

All of these suggestions are valuable. This article is one attempt to put them into effect and more efforts will be made. We hope that at least some readers become interested in the Breeding Bird Survey and encourage you to get in touch with the provincial coordinator, Jack Park, or with any of the authors. Conducting the questionnaire has been a good way to get to know our colleagues and to gain some insight into making the Breeding Bird Survey more effective in Alberta.

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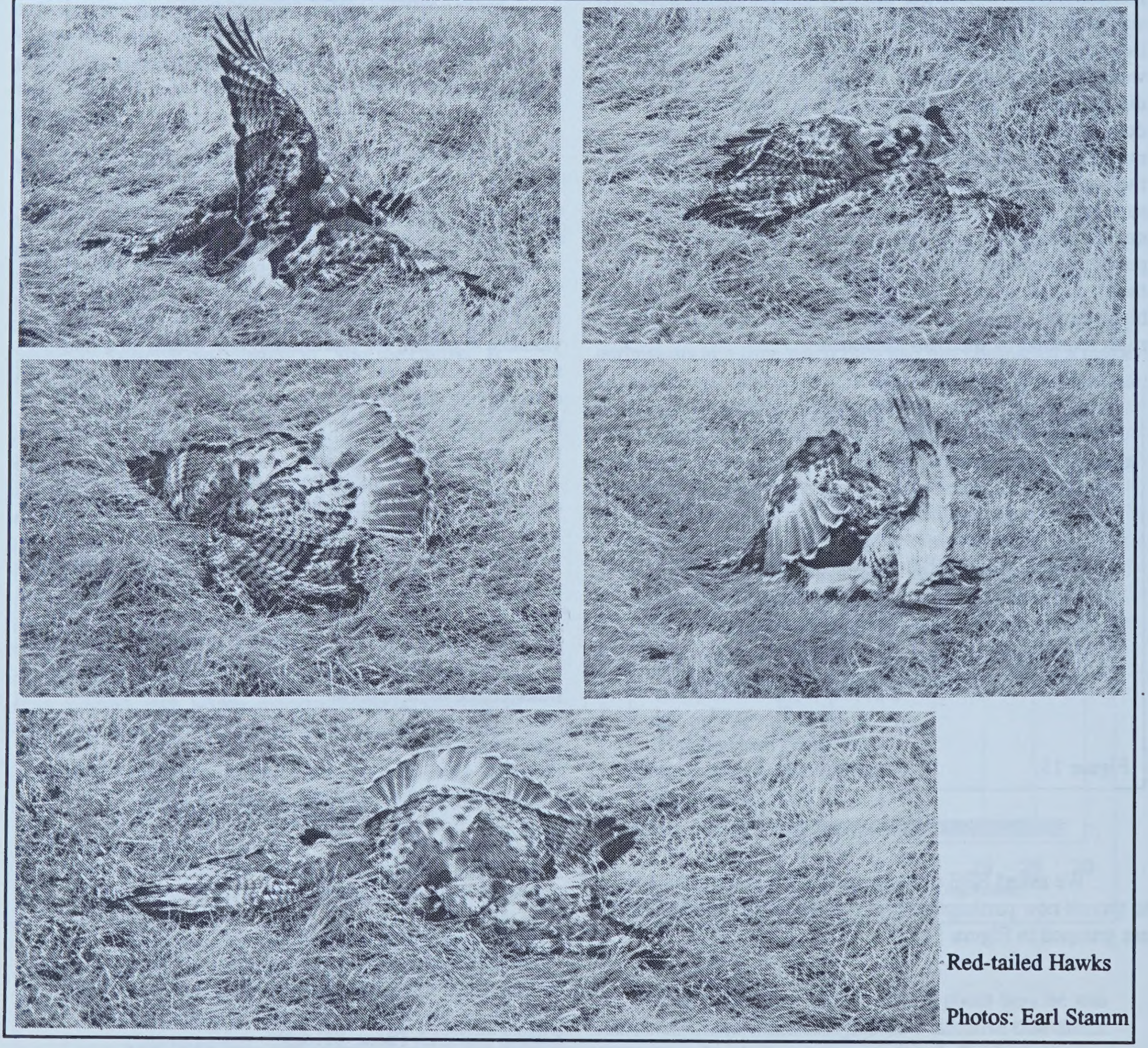
Red-tailed Hawks in Mortal Combat

Earl Stamm

Last spring I was able to document a very interesting event. I observed two Red-tailed Hawks engaged in mortal combat. They were locked foot-to-foot and biting each other about the mouth and face.

I watched them for more than 15 minutes and got within 20 feet of them before they noticed me. The birds then disentangled and disengaged from one another. At this point they flew away, one in hot pursuit of the other.

Normally, pairs of Red-tails nest an average of 1.5 kilometres away from each other. Very seldom do they get involved in territorial desputes. However, when they do, it is usually a male defending against another male.



Red-tailed Hawks

Photos: Earl Stamm

Author's Address:
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Alberta Bird Checklist Project

Glen Semenchuk, Executive Director

Over the past several years, bird watching has become a major recreational pursuit in Albert, one which has been encouraged by the move towards more non-consumptive use of wildlife resources. Its popularity was demonstrated by the Alberta Bird Atlas Project in which over one thousand volunteers participated.

Over the five year field portion of the Atlas project (1986-1991) volunteers participated by going out into the field and recording breeding status and the relative abundance of the breeding bird species of Alberta. This data, collected in a systematic manner, resulted in a valuable data base. The Atlas gave a picture of what was happening in the province in that period and, by comparing it to earlier information, gave some indication of bird distribution trends in the province.

As a result of FAN publishing *The Atlas of Breeding Birds of Alberta*, a ''Bird Atlas Database'' was established. It is a system of 12 databases and over 60 individual programs for data entry, data editing, report reproduction and map production.

With the number of Albertans involved in birding, it is desirable to continue the collection of bird data in the province. In order to harness this resource, a consistent recording system must be established and there must be a focal point for the distribution, collection and compilation of the data records.

Bird watchers normally keep some form of record of their observations over a given period of time. This simple form of record keeping has provided information on geographic ranges and seasonal occurrences of migration. Temple and Temple (1976), in their study of avian population trends in central New York State from 1935 - 1972, found that checklists can be used to monitor temporal and spatial variation in the abundance of birds.

Two major checklist programs have been initiated in North America to formalize the gathering of this type of information. In Quebec, a checklist program was started in 1948, and, in 1975, computer coding of all data was initiated. This resulted in the Etude des Populations d'Oiseaux du Quebec (EPOQ) or Studies of Bird Populations in Quebec. This database contains more than 2.2 million records of observations recorded on 158,000 checklists from 3,600 observation sites.

The Wisconsin Checklist Project was initiated by the Wisconsin Society for Ornithology in 1982. Over 30,000 checklists have been returned for analysis. Temple and Cary (1990), in their description of the Wisconsin Project, concluded that the approach has considerable merit and is readily accepted by volunteer cooperators. It produces interpretable data reflecting seasonal, geographic and year-to-year variations in bird populations.

In order to initiate a province-wide collection project, FAN invited representatives of the Provincial Museum of Alberta, Alberta Fish and Wildlife, the Canadian Wildlife Service and the local birding community to assist in the design of a data collection card. The card was designed to be user friendly, and to record data that would be valuable to management agencies and provide checklist information to the birders collecting the information.

A pilot project was then initiated to distribute a limited number of the data cards to management agencies, birding clubs and individuals across the province. Participants were asked to use the checklists and provide feedback on the content and format. The initial response to the idea of a standard province-wide data collection record was very positive with several suggestions as to the checklist form. Several conditions were identified to allow a province-wide data collection program to proceed:

* it will be organized at the local level.
* support (including data forms, software to enter the data and produce basic reports) and easy access to a central data base must be provided.
* a committee must be in place to adjudicate range extensions and the sightings of new species.
* the establishment of a central data collection and storage system.

FAN received funding from the Alberta Sport, Recreation, Parks and Wildlife Foundation to establish the network and the central data centre, as well as to develop the software for distribution to the network. It is planned to establish a bulletin board service to allow data transfer to the central data base. Early in 1995, FAN will be contacting local groups who may be interested in participating in this program.

The Provincial Museum of Alberta has initiated the formation of a Alberta Bird Record Committee under the chairmanship of Dr. Jocelyn Hudon, the curator of ornithology. Membership was drawn from across the province with two meetings being held to date to establish the mandate and working mechanisms of the committee.

FAN will coordinate the production of an Alberta Bird Checklist form and will be contacting individuals and clubs across the province who may be interested in participating in the program. These participants will be asked to be local contacts for birders in their area. They will be given forms to distribute in their areas as well as the computer software to do the data entry and report production. The forms will be available in March 1995.

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Alberta

Dinosaur Provincial Park - Well Licences

When Dinosaur Provincial Park was first established, privately-owned lands were included within the park boundaries. Then, in 1979, these lands were deleted from the park due to amendments to the *Provincial Parks Act* which excluded private lands from within provincial parks. The area has also been designated by the United Nations as a World Heritage Site.

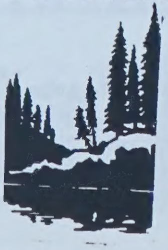
In spite of this designation, within the park, south of the Red Deer River, the mineral rights are owned as freehold minerals. These rights do not have an expiry date. The park is required to provide access to these resources or provide compensation, that is, buy out the mineral rights if requested by the owners of these rights.

Within and along the perimeter of the park there are five well licence applications from Sceptre Resources and Imperial Oil Resources that have been approved by the Energy Resources Conservation Board. Considering the potential environmental impact of well development in the area, the Federation, along with the Alberta Wilderness Association and the Canadian Parks and Wilderness Society, requested suspension of the drilling to hold public hearings. Alberta Parks Service responded to this request by stating, ''We have attempted to place stringent conditions on this access...Although there is some element of risk involved in any industrial activities, we believe the conditions we have placed on development will greatly reduce the risk.''

The ERCB then stated that they accept that the licence applications fully meet the land use guidelines for the area and, considering the Alberta Parks Service reply, they ''are satisfied that matters pertaining to the integrity of Dinosaur Provincial Park and the World Heritage Site were subjected to significant review and planning and are adequately addressed by the respective land managers in accordance with government policy.''

Subsequently, a specific incidence of excessive surface disturbance within the park was brought to the attention of the ERCB. Their response was that they ''concur that this was clearly contrary to the requirements of the Land Manager of the area. However, the Board is satisfied that this unfortunate occurrence was the result of an unusual set of circumstances that resulted in inadequate communication of the Land Manager's requirements." The ERCB further stated that they would still not consider holding hearings on this matter.

FAN will continue to monitor this situation in light of the regard the ERCB holds for designated World Heritage Sites.



Cardinal River Coals

Cardinal River Coals Ltd. has proposed to develop a surface coal mine and processing plant in the area of Mountain Park, south of Hinton. The property consists of 10,040 ha of land along a 23 km coal bearing trend paralleling the Front Range of the Rocky Mountains. The new mine, to be known as the Cheviot Mine, is described by the proponent as ''a comprehensive project involving the establishment of surface mining operations, construction and operation of a coal processing facility, refurbishing the rail transportation system, and providing related infrastructure such as shop/office facilities, utilities and road transportation."

The company states that this site was chosen because ''of abundant reserve of high quality coal..., the mine site is favourably zoned for coal mine development..., experienced workforce and use of existing community infrastructure..., and the mining environmental control programs and land reclamation procedures proven at the Luscar site can be applied with confidence at operations at the Cheviot Mine."

Cardinal River Coals Ltd. has issued a proposed terms of reference for the Environmental Impact Assessment and has circulated the document for public input. Alberta Environmental Protection will issue a final terms of reference to the company.

The major concerns with this development are:

1. The majority of the land it impacts is in the alpine and sub-alpine ecoregions and has been identified as critical wildlife habitat in the Coal Branch Sub-regional Integrated Resource Plan.
2. The proposed mining area includes the headwaters of Prospect Creek and portions of MacKenzie Creek, the McLeod River and the Cardinal River.

The Federation of Alberta Naturalists will be involved in all aspects of the public consultation program and any subsequent hearings associated with this project.

Rigel Energy Corp. - Sheep River Project

Rigel Energy Corporation and partners have acquired the petroleum and natural gas rights to 4,928 ha in the Sheep/Threepoint Creek Resource Management area in the Eastern Slopes. The mineral lease is in an area of Kananaskis Country and includes part of the Sheep River Sanctuary. This sanctuary was established to provide seasonal protection from hunters for the bighorn sheep populations in the area. The proponent is presently undertaking an inventory of environmental and land use information which can be used to assess potential effects of both exploratory drilling and any ensuing field development.

FAN is identified as a stakeholder and will be a part of the public consultation process on this development.

ssues

Banff National Park

Canadian Pacific Limited has submitted three proposals to Parks Canada for which it is seeking development approvals. In exchange, CP will return particular leases and freehold lands to the Crown. The three proposals, all in Banff National Park, are:

- Banff Springs Golf course expansion
- Banff Rail Station area redevelopment
- Chateau Lake Louise meeting facility development.

Under the Environmental Assessment and Review Process Guidelines Order, each of the proposals will be subject to an environmental impact assessment.

Parks Canada has prepared draft terms of reference for each of the three activities as well as a Contaminated Site Assessment of Banff Railway Lands. The Federation of Alberta Naturalists has been recognized by Parks Canada and Canadian Pacific Limited as having a particular interest in the project and will participate in the consultation process as a stakeholder group. At present, FAN is commenting on the adequacy of the draft terms of reference.

Carbondale Pipeline Project

This project was previously designated as the Coleman Pipeline Project. Shell Canada has proposed constructing a collector pipeline for three existing gaswells in the Coleman area. FAN's concern with this project is that new access not be provided into a relatively undisturbed area. The proponent has taken this concern into consideration and has proposed using existing rights-of-way and roads. The proposal would apply closures to these roads in accordance with the Castle Access Management Plan that was approved by Alberta Environmental Protection in early December.

Public hearings were conducted by the Energy Resources Conservation Board from December 6-9 in Pincher Creek. The main environmental issue lay in the question of whether this project is a suitable hook on which to hang a complete cumulative effects assessment of the Waterton Field, as claimed by the Rocky Mountain Ecosystem Coalition, or whether the scale of the project makes it more appropriate to focus on the net improvement to wildlife security in the area, as supported by the Federation of Alberta Naturalists.

An ERCB decision on the application is expected in early February, 1995.

Special Places 2000

The Special Places 2000 Draft Policy has not been adopted as government policy as yet. The Federation, along with the Alberta Wilderness Association and the Canadian Parks and Wilderness Society, initiated a community-based program to help local groups identify and lobby for candidate areas. The planning phase, funded by the Recreation, Parks and Wildlife Foundation was completed in the fall of 1994. The joint steering committee of this project has agreed to proceed with the implementation phase in anticipation of government adoption of the draft policy. At present, a fundraising campaign is underway to fund the three year implementation program.

Alberta Government Legislation

The provincial government in the fall 1994 sitting introduced two new bills that the Alberta Environmental Network identifies as "having a profound implication for the future of Alberta...putting the integrity, health and protection of Alberta's environment at stake."

Bill 41, the *Government Organization Act*, gives the authority to any cabinet minister to delegate his authority, and accountability, to any other minister, and allows the Minister of Environmental Protection to sell Crown land without discussion or public review. Previously, Alberta Agriculture was responsible only for the day-to-day management of public lands in the White Zone (settled, non-forested land). These public lands include some of the best examples of native prairie and parkland anywhere in the world. The provisions in this bill would fully transfer White Zone Public Lands to Alberta Agriculture and open the door for the sale and privatization of these lands. It is also ambiguous about which minister is responsible for wilderness areas, and the *Ecological Reserves and Natural Areas Act*. This bill was passed in late 1994.

Bill 57, the *Delegated Administration Act*, states, "The minister may enter into a contract with a corporation under which the responsibilities of the minister or of a public official under an enactment are exercised by the corporation instead of by the minister or a public official." Under the provisions of this bill, the minister may complete this delegation of authority to a corporation or delegated regulatory organization after only one public hearing. The organization would then raise and retain revenues to fund its operation. Some concerns that have been raised regarding this legislation are:

- licences to operate industrial plants, such as pulp mills and chemical plants, could be issued by a private corporation,
- provincial parks could be fully privatized,
- fish and wildlife management could be privatized,
- management of Crown grazing leases could be handled by a corporation with no interest in public access, and
- water management could be privatized and water licences could be issued by private corporations.

This bill was withdrawn at the fall sitting of the legislature, but it will probably be reintroduced in the spring of 1995.

Supporting our Wildlife: Alberta's Fish and Wildlife Trust Fund

One of Alberta's best kept conservation secrets is the Fish and Wildlife Trust Fund. Despite the fact that some of its programs have been in existence since the 1960s, many people remain unaware of the Trust Fund and what it seeks to accomplish.

The Fish and Wildlife Trust Fund was established under Alberta's *Wildlife Act* to fund programs that protect and enhance fish and wildlife and their habitats. It also funds programs to prevent wildlife damage, and to promote the development and use of humane traps. The Fund programs are a vehicle through which the public can learn about, contribute to, and participate in the enhancement and protection of Alberta's fish and wildlife resources.

Included among the programs which the Fund supports are:

1. The Buck for Wildlife Program, the purpose of which is to retain, enhance or create fish and wildlife habitats. This program receives funding from fishing licence fees (one-third of total fees), the sale of the Resource Development Stamp on hunting licences, pheasant licence fees and hunting draw application fees.

2. The Fisheries Management Enhancement program, which is designed to meet the increasing demands of recreational fishing by providing funds to enhance fish production and protection. This program receives one-third of fishing licence fees.

3. The Wildlife Management Enhancement Program, which funds programs and projects that ensure the well-being and perpetuation of wildlife populations. Funds for this program come from a portion of the 1991 fee increase on licences.

4. The Report of Poacher Program, which is designed to enhance the detection and apprehension of violators through increased public involvement. One dollar from each recreational hunting licence (except the pheasant licence) is contributed to this program.

5. The Waterfowl Protection Program (North American Waterfowl Management Plan), established in 1991, whose purpose is to undertake conservation, enhancement and restoration of wetland-related habitat for waterfowl and other wildlife.

6. The Wildlife Support Program, which was established to compensate for some of the damage or loss caused by wildlife; to fund measures taken to prevent migratory bird damage or loss to property; and to compensate for injury or death of livestock resulting from the use of a weapon during an open season. This program is funded from the Wildlife Certificate.

7. The Humane Trapping Program, whose purpose is to fund the development and use of humane trapping systems by supporting research, trap testing, trap replacement and education of trappers and the public. All fur royalties collected by the province go towards this program.

In addition, a General Trust exists which provides support for those projects that fall within the scope of the Trust Fund, but which are not specifically provided for by existing programs. Advisory committees provide advice in the management of the programs which receive support from the Trust Fund.

Although Alberta's Fish and Wildlife Trust Fund is regulated by the provincial government, it utilizes public money over which the Alberta legislature has no power of appropriation. As well as deriving revenue from licencing fees, tax deductible private donations and bequests to any portion of the Trust Fund are encouraged, and joint ventures with private organizations and individuals are undertaken.

Further information on the Fish and Wildlife Trust Fund or any of its programs can be obtained by contacting the Director of the Fund at: 9920 - 108 Street, Edmonton, Alberta T5K 2M4; or by fax at (403) 422-6641; or phone at (403) 427-5192.

1995 Emeralds

Nominations are now open for the 1995 Emerald Awards. These awards recognize Alberta organizations and individuals who have made outstanding contributions to preserving, protecting or enhancing our environment. The application deadline is February 28, 1995. For information contact the Alberta Foundation for Environmental Excellence at (403) 482-9200 or Fax (403) 428-0015.

Alberta Lakes: A Perspective On Water Quality

Patricia Mitchell

Lakes are much more than a depression in the ground, filled with water. The first thing a person might see on approaching a lake are plants: large plants growing in the water, such as the bulrushes and cattails along the edge, or feathery-leaved plants such as pondweeds submerged beneath the surface. Or, one might see green water, caused by tiny one-celled plants called algae. Plants form the food base for a multitude of other organisms: bacteria, one-celled animals, tiny crustaceans forming the zooplankton, insects of all types, worms, snails, and then the fish, birds and mammals that inhabit the lake environment and provide an attraction for people.

Even the water is more than it might seem. Water in lakes in never "pure". It contains various natural chemicals derived from the physical environment in which the lake is situated. Alberta lakes--at least those outside of the mountains--contain a good supply of various substances, because our soils are rich in minerals, nutrients and organic matter. Most of our prairie, parkland and boreal forest lakes have always been rich in these materials, ever since the lakes were formed after the last glacial ice sheet retreated several thousand years ago.

Most people are aware of the variety of lakes in the province. Some are clear and cold, even in midsummer, and aquatic plants are spare. Others have clear water, but support abundant shoreline aquatic vegetation. Many lakes have dense shoreline vegetation, and also green, murky water in July and August. Other lakes seem to be bursting at the seams with plant growth, particularly with dense growths of blue-green algae that form unpleasant scums, and then sewage-like odours when the "bloom" dies. The key to this variety is the amount of nutrients the lake water contains.

Nutrients are chemical compounds that plants require for growth. Plants in a garden and plants in a lake require essentially the same types of chemical compounds: nitrogen, phosphorus, potassium and trace elements. In a lake, the nutrient that governs the amount of plant growth is usually phosphorus, rather than nitrogen, the typical limiting nutrient for terrestrial plants. Thus, if a lake with a moderate growth of algae receives an additional supply of phosphorus, the amount of algae in the lake will likely increase. Lakes with high concentrations of phosphorus tend to be very green in summer, whereas those with low concentrations tend to be clear.

Where does phosphorus come from? The main source of nutrients is the watershed, the land that drains water toward the lake. A watershed that is in natural forest, unaltered by human activities, will supply nutrients to the lake. But clearing the land for agriculture or a cottage subdivision could increase the supply. If cattle are allowed access to the lakeshore, or to creeks draining to the lake, or if faulty or improperly constructed sewage systems leak waste to the lake, the nutrient supply is even higher. Even snow and rain falling on the lake may contain small amounts of nutrients. Any activity that exposes soil, which is then transported to the lake, can also increase the nutrient supply.

Human alterations of the watershed on some of our lakes have likely made them more productive--they grow a larger crop of algae and shoreline vegetation. But most lakes have probably not changed appreciably. Unfortunately, we have no record of what water quality was like in our lakes before European settlement of the area. Alberta Environmental Protection's lake sampling program only goes back about 20 years, which is a very short period in the life of a lake. There are a few lakes, however, that we are fairly sure have changed. Some of the evidence is circumstantial. If a lakes's watershed is very heavily developed, it is probable that the nutrient supply has increased. Lake user's complaints about deteriorating water quality provide additional evidence. The best evidence, of course, is measured increases in the phosphorus concentration or the amount of algae in the water. This has been documented for one or two lakes.

The lake bottom sediments are a complicating factor, because they can take up phosphorus from the water. Extra phosphorus supplied by watershed changes could all go into the sediments rather than growing more algae. The bottom sediments are rich in this essential plant nutrient. In many Alberta lakes, particularly shallow ones

Lake Eden - one of Alberta's most popular lakes.
Photo: Patricia Mitchell

the phosphorus adsorbed to sediment particles can release and return to the water. This generally occurs in summer, when the water is warm. Algae take advantage of this "fertilizer", and a blue-green algal bloom may result. Alberta lakes are particularly adept at this phosphorus recycling process. What is not known, however, is whether phosphorus recycling increases when human activities cause the phosphorus supply from the watershed to increase.

Many people believe that our highly productive lakes are dying, and particularly that fish populations are adversely affected. Actually, the opposite is true--these lakes suffer from too much life. Up to a point, an increase in algal productivity in a lake could enhance the fish population. Sometimes, of course, a heavy growth of plant material in a shallow lake in autumn could lead to a kill of fish over winter as the dissolved oxygen declines. Or, the sudden death of a summer algal bloom could produce the same phenomenon. As the algae decompose, oxygen is used up and a summer kill occurs. However, native sport fish such as northern pike, yellow perch and walleye are well adapted to our highly productive lakes.

Are Alberta lakes in trouble? For the majority, particularly in northern parts of the province, the answer is no. Even the green prairie lake has probably always been that way, and should be accepted for what it is. Some lakes, especially those in agricultural areas, have likely been affected to some extent. The water quality in these lakes could be protected by reducing the flow of nutrients from agricultural and recreational developments through simple housekeeping efforts of landowners. For those few lakes that have obviously been impacted, more intensive watershed cleanup programs may be necessary. These would require a concerted and cooperative effort from landowners, lake users and local and provincial governments.

For the rest of our lakes, a change in attitude is in order. The cottage owner sees weeds and algae, and thinks "pollution", and "who caused this...my neighbor?". Instead, he or she should look into the water and see a fascinating, interconnected ecosystem that leads from sunshine and aquatic plants to the fish caught early that morning or the Great Blue Heron standing in the bulrushes nearby. An understanding and acceptance of the way lakes are will offset the nuisance of blue-green algal blooms, swimmer's itch or summer fish kills, all natural components of our highly productive lakes.

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Update: Proposed Federal Endangered Species Legislation

In Canada, 236 species of native plants and animals are considered endangered, threatened or vulnerable. The development of comprehensive legal protection for these species is a first step in meeting Canada's commitments under the international Convention on Biological Diversity --a global agreement signed in 1992 to protect native species and natural habitats.

Only four provinces have endangered species laws: New Brunswick, Ontario, Quebec and Manitoba, and, at present, there is no federal endangered species law. However, in November 1994, a discussion paper giving options for the development of a new federal endangered species' law, as well as a national framework for endangered species legislation, was released for public review by federal Minister of Environment, Sheila Copps.

As set out in the discussion paper, the new law would apply to federally regulated species (those listed under the *Migratory Birds Convention Act* and the *Fisheries Act*), species on federal lands, those affected by federal activities and species considered to be of national concern. The legislation would be drafted in close cooperation with the provinces, aboriginal people and interested individuals and associations.

In its *Rationale Document* (1994), the Canadian Endangered Species Coalition has identified what it believes the new federal legislation should do, as follows:

* the legislation should give teeth to the COSEWIC and RENEW programs already underway;
* it should provide uniform protection to species at risk from across Canada and in our territorial waters;
* it should provide for the scientifically-based assessment of all species at risk;
* once a species is listed "at risk", legal protections should be required for that species and its habitat;
* the law must provide for recovery plans;
* it should enlist the support and cooperation of other jurisdictions, First Nations and environmental groups in its implementation;
* as required by the Biodiversity Convention, there should be prior assessment and review of development projects that might impact on a species at risk; and
* the law should have teeth, with strong penalties.

A consultation process based on the federal document will begin in January 1995. The Endangered Species Coalition will press Sheila Copps to keep to her word when she said she wanted legislation introduced in the spring. (The Endangered Species Coalition includes the following organizations: Canadian Nature Federation, Canadian Parks and Wilderness Society, Sierra Club of Canada, Sierra Legal Defence Fund, Union Quebecoise pour la Conservation de la Nature and World Wildlife Fund.)

It should be noted that the Alberta provincial government is opposed to federal endangered species legislation.

After the Action Plan - What's Next for Prairie Conservation?

Elizabeth Saunders (Savoy)

"In only 100 years, the Canadian Prairies - grasslands and parkland - have become so radically transformed by human activity that they have become one of the most endangered natural regions in Canada." - Prairie Conservation Action Plan, World Wildlife Fund, 1988.

History of the Prairie Conservation Action Plan

Most Albertans interested in prairie conservation have heard the alarming figures--only 25% of Alberta's original fescue grasslands remains (and much of it is over-grazed); all but a few small patches of tall grass prairie have vanished; more than one-third of endangered birds and mammals come from the prairie provinces...... and so on. It often surprises people to find out that World Wildlife Fund, whom we associate with pandas and other endangered species from far away, is concerned about our "bald-ass prairie" and has been acting on these concerns.

In 1986, World Wildlife Fund Canada launched the "Wild West" program to act on the World Conservation Strategy objectives at a regional and local level in prairie Canada. One of the components of the Wild West program was to draft a Prairie Conservation Action Plan for endangered and threatened habitats and species. A group of individuals, agencies and organizations worked together to develop a five year plan aimed at conserving and managing native prairie and parkland communities.

The Prairie Conservation Action Plan (PCAP) was published in the fall of 1988 and released by World Wildlife Fund Canada in conjunction with the governments of the three prairie province. The plan consisted of 10 goals and related action recommendations, which outlined what needed to be done over the five year period 1989 to 1994, in order to conserve the biological diversity of the prairies. The Action Plan was formally launched at the Second Prairie Conservation and Endangered Species Workshop held in Regina in February 1989.

In response to the PCAP, the provincial government initiated a multi-stakeholder committee to oversee the implementation of the plan. Alberta was the only one of the three prairie provinces to use this approach. The Prairie Conservation Coordinating Committee (or PC-cubed as it came to be known by its members) consisted of more than 48 member agencies representing a diversity of interests: government agencies including the Canadian Wildlife Service, Alberta Economic Development and Tourism, and Alberta Fish and Wildlife; non-government organizations such as the Federation of Alberta Naturalists, Alberta Wilderness Association and Alberta Cattle Commission; and industry representatives such as CN Rail, the Coal Association and the West Stock Growers Association. The Prairie Conservation Coordinating Committee (PCCC) was tied to the duration of the Action Plan and its purpose was to "encourage effective implementation of the Prairie Conservation Action Plan in Alberta."

As well as encouraging implementation of the 10 goals of the Action Plan, one of the greatest merits of the PCCC was the convergence of a diverse group of people all interested in the conservation of Alberta's prairie and parkland. As Miles Scott-Brown, Chairperson of the Committee in 1993 stated, "There is no other place that I know of where cattlemen, conservationists, government and a wide range of other users can all sit at one table and talk." This convergence didn't necessarily mean that the committee was able to reach agreement on all issues, but members were given a forum to talk, listen and understand all sides of prairie conservation issues. Many long term partnerships and projects were forged as a result of the PCCC meetings. Ian Dyson, secretary of the PCCC, points out that, "We do have a number of success stories--the National Wildlife Area at Suffield; a course on wildlife values held at Brooks; and a lot of progress on cooperative projects." Dyson comments that, "The plan provided a specific conservation focus for the prairies and gave government agencies and conservation groups a target to aim for--it has enabled PCCC member agencies to look at their own initiatives and place them into an overall vision."

So now that the life of the original PCAP has come to an end, where is the Action Plan, what was achieved in Alberta, and where do we go from here?

Over the last year, the PCCC has been working hard towards creating a new Action Plan, custom-designed for Alberta, but tied in with the goals of the other prairie provinces. PCCC members felt that it was important to create a new plan for the next five years to ensure that the vision for Alberta's prairies remained current, relevant and challenging.

A workshop was held at Lethbridge in June 1994 for PCCC members and a variety of additional prairie stakeholders with the goal of coming to a consensus on the direction of the new plan for the next five years. Despite the diverse group of interests present at the workshop, participants were able to agree on the overall approaches to a new plan. A PCCC steering committee then took the input from workshop participants and developed a draft revised plan over the late summer and early fall.

The following points summarize the primary modifications in approach between the first plan and the new plan:

1. The base of support for the new plan needs to be broadened, especially within the agricultural community.
2. There should be a greater focus on ecosystem approaches rather than solely single species approaches to conservation.
3. There is a need for greater involvement at the local, grassroots level and increased community empowerment.

Although the draft plan has been reduced from 10 overall goals to four, in general, the intent of the original goals remains and is found in specific objectives listed under each goal heading. Action statements are specific and measurable and include a timeline where appropriate. For example: "Sites in the Ross Lake, Dune Point and Prairie Coulee areas should be protected by 1997. The Lost River site should be protected by 1999."

The draft plan is currently being reviewed by PCCC member agencies and will be presented for discussion at the upcoming Prairie Conservation and Endangered Species Workshop at Lethbridge in February 1995. After the workshop, a second draft will be developed and the general public will have an opportunity to provide input. The final step in the process will be to integrate Alberta's Action Plan with Manitoba and Saskatchewan efforts and produce a revised Prairie Conservation Action Plan by December 1995.

The implementation of the new plan, and ultimately the future of Alberta's prairie ecosystems, will depend on a variety of government agencies, non-government organizations, industry, landowners and individuals working cooperatively. Many of these groups have already been working hard towards achieving the goals of the Prairie Conservation Action Plan over the last five years. The challenge will be to continue this momentum and involve more groups, individuals and landowners as we head towards the year 2000 and strive to achieve the goals of the new Action Plan.

Prairie Crocus Photo: P.S. Debnam

If you would like to see a copy of the draft plan, provide input and see what you or your organization can do to further prairie conservation, contact the author (your FAN representative on the PCCC and steering committee member). Details of the original PCAP vision and goals, and Alberta's new draft plan are provided below.

Original Prairie Conservation Action Plan Vision and Goals 1989 - 1994:

Vision

Canadians need to ensure that native prairie, with its wild plants and animals, survives in the west and is conserved for its intrinsic values, from which this and future generations can benefit.

Goals

1. Identify the remaining native prairie and parkland.
2. Protect at least one large, representative area in each of the four major prairie ecoregions.
3. Establish across the three prairie provinces a system of protected native prairie ecosystems, and where possible, connecting corridors. This system should include representative samples of each habitat subregion.
4. Protect threatened ecosystems and habitats by preparing and implementing habitat management and restoration plants.
5. Protect and enhance the populations of prairie species designated nationally or provincially as vulnerable, threatened, endangered or extirpated, by implementing recovery and management plans.
6. Ensure that no additional species become threatened, endangered or extirpated.
7. Encourage governments to more explicitly incorporate conservation of native prairie in their programs.
8. Encourage balanced use of private lands that allows sustained use of the land while maintaining and enhancing the native biological diversity of the prairies.
9. Promote public awareness of the values and importance of prairie wildlife and wild places.
10. Promote research relevant to prairie conservation.

Alberta's Draft New Prairie Conservation Action Plan Vision and Goals, 1995 - 2000:

Vision

A healthy and diverse native prairie ecosystem is conserved in Alberta for the benefit of current and future generations.

Goals

1. Advance the identification, understanding and use of information about Alberta's prairie and parkland ecosystems.
2. Ensure governments at all levels have in place policies, programs and regulations that favour the conservation of Alberta's native prairie ecosystem.
3. Adopt land use and management practices across the whole prairie and parkland landscape that conserve diverse and healthy ecosystems.
4. Increase awareness of the values and importance of Alberta's native prairie ecosystem

Prairie Conservation Occasional Paper Series

In 1993, the Prairie Conservation Coordinating Committee initiated an Occasional Paper Series, designed to provide a forum for Albertans to publish non-technical essays on topical prairie conservation issues. The first paper in the series "The Rules of the World" was written by rancher Francis Gardner of Mount Sentinel Ranch in the Porcupine Hills.

The Committee is looking for input into this series and it encourages the submission of papers in all areas relating to prairie conservation with a focus on non-technical aspects, conservation philosophies and insights. If you feel you have a particular perspective on the prairies, you may want to consider these Occasional Papers as a place to publish your perspective. Manuscripts should be at most 10 typed pages.

For copies of the first paper in the series or to submit a proposal for a paper, contact Ian Dyson, PCCC Secretary, Regional Coordination Services, Alberta Environmental Protection, Sun Centre Building, 530 - 8th Street South, Bag 3104, Lethbridge, Alberta T1J 4C7.

Author's Address:
Box 59, Monarch, Alberta T1J 0P6.

The Fourth Prairie Conservation and Endangered Species Workshop
Sharing the Prairies--Sustainable Use of a Vulnerable Landscape

To find out more about prairie conservation issues and the new Prairie Conservation Action Plan, consider participating in the Fourth Prairie Conservation and Endangered Species Workshop, to be held in Lethbridge from February 23 - 26, 1995. The workshop is built around the theme "Sharing the Prairies" and will be of interest to naturalists, farmers, ranchers, academics and resource professionals.

The workshop will be focusing on four themes: endangered species, ecosystem management on the prairies, policies and programs affecting prairie conservation and the Prairie Conservation Action Plan. Over 50 working sessions and talks will be offered, as well as a variety of posters and displays.

Registration will commence on the evening of Thursday, February 23, with a wine and cheese social at Lethbridge Community College. Opening plenary sessions and workshop sessions will be held at the University of Lethbridge on Friday and Saturday. A banquet will be held at the College on Saturday evening, featuring "Charlie Russell's Yarns" by entertainer Raphael Christy, as well as the presentation of the Prairie Conservation Awards. On Sunday, February 26, the highlights from each of the four theme areas will be summarized and presented at a final plenary.

Conference registration is only $26.00 and $15.00 for students. Tickets for the banquet are $20.00 (pre- registration is required). To register or for further information contact: Institute for Renewable Resources Management, Lethbridge Community College, 3000 College Drive South, Lethbridge, Alberta T1K 1L6. Phone (403) 382-6971; Fax (403) 320-1461.

Let no one say
And say it to your shame
That all was beauty here
Until you came

The Prairie Nest Box Monitoring Program

or What's Happening on the Other Side of the Fence?

Ted Code and Louise Horstman

With some plywood, nails and a nest box plan, many a back country road has been converted into a linear nature trail full of intrigue, adventure and science. Readers who have their own nest box trails along fencelines know well the intrigue of eggs that come and go, the adventure of finding something unexpected in a nest box, and the science of comparing hatching and fledging rates from year to year. To these ingredients, the Prairie Nest Box Monitoring Program adds another--what's happening on the other side of the fence?

In the mid-1980s, the widespread use of grasshopper insecticides led to concern over their possible effects on birds. Due to yearly variations in weather and other environmental factors, it was felt that long term field monitoring was needed. In 1989, with the help of the Canadian Wildlife Service and funding assistance from the Toxicology Fund of World Wildlife Fund Canada, the Prairie Nest Box Monitoring Program was started up in the three prairie provinces. This program was designed to combine nest box data from agricultural areas with information about the pesticides used on adjacent fields. In this way it would be possible to conduct statistical tests on the effects of pesticides and other environmental factors on hatching, fledging, mortality and nest abandonment rates.

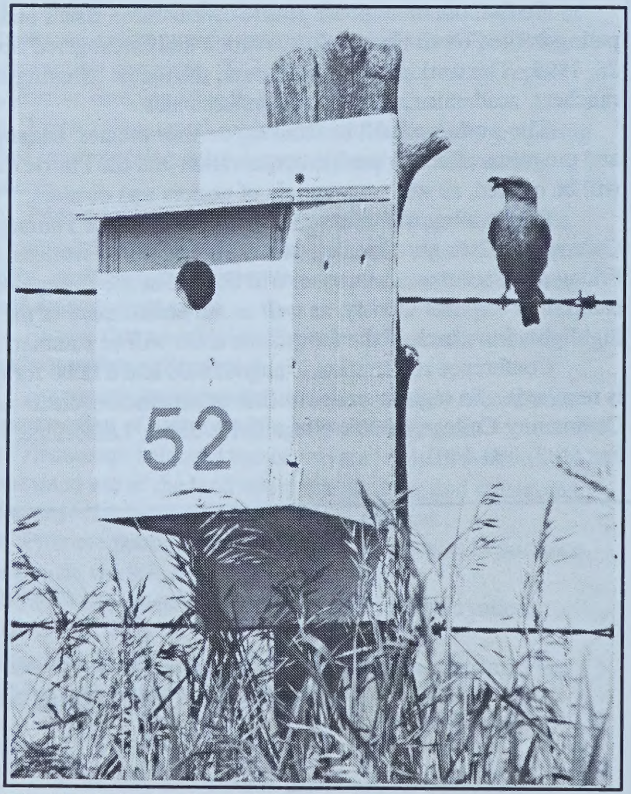
For the program to be long term, it had to be low-cost, relying on volunteers to collect the nesting data. The first major question, therefore, was: Are there enough trail operators in farming areas who would be willing to monitor their nest boxes approximately once a week? The answer turned out to be yes--since the start of the program, about 80 trail operators have participated. And we are always looking for new participants, as there is the inevitable turnover of people who move or become unable to take nesting data on a weekly basis.

The next question was whether farmers would provide the pesticide information needed. Could and would they tell us what they had applied to their fields near the boxes and when? Having talked to more than one agricultural fieldman who reacted in a hostile manner to the suggestion that pesticides might affect birds, we initially approached the farming community with caution, expecting to be told on occasion that what they did was none of our business. (And, of course, we were prepared to accept this answer.) Happily though, we have never met this reaction. Farmers have been extremely helpful and interested in their feathered visitors, especially those of the bright blue variety. Some have even put up their own nest boxes in addition to the participating trail's.

There was also the question of how exposed nest box occupants would be to any pesticides applied on nearby crops. For the Tree Swallow, dietary exposure (generally the most toxic exposure route for birds) was not expected. If any adverse effects from pesticides were seen with this species, it would likely be due to a lack of insects after spraying. But the primarily ground-foraging Mountain Bluebird might bring contaminated insects back to its nestlings from nearby sprayed fields. The debate over whether bluebirds will use crops for foraging needed some investigation.

We were able to do this using the "Brats and Bluebirds" trail near Coronation. Observing 11 pairs of nesting adult bluebirds from mid-May to early July, we found that all fields within a 120 m radius of the nest were used frequently for foraging--including canola, grain, alfalfa and hay fields. Pastureland was also used frequently, but its presence did not appear to preclude or reduce the use of nearby crops. Thus, for first clutches at least, we feel safe in assuming that any crops near the nest will be used for foraging.

Do the birds avoid sprayed crops? We have had the opportunity to look for any changes in foraging behaviour



Bluebird bringing food to the nest box.
Photo: "Coronation Review"

following the application of an insecticide. A farmer along one participating trail sprayed a portion of the foraging territory of an adult bluebird pair during the nestling stage (first clutch), and we measured before-and-after foraging frequencies. Immediately after the spraying, the amount of foraging done by the pair in the sprayed area rose significantly. After about 24 hours, it declined to below normal and then returned gradually to normal over the next 48 hours. Thus, it appeared that the birds were attracted to the dying insects and then lost interest in the area when the insects were dead or well-picked over. The gradual return to normal levels probably reflected the ingress of new insects.

The ''Brats and Bluebirds'' summed it up well when they erected a sign entitled ''Farmers Helping Bluebirds'', listing all the landowners along their nest box trail. The program's success to date has been due to both the dedication of participating trail operators and the assistance of the farmers along their trails.

Over the years, the Prairie Nest Box Monitoring Program has received funding assistance from Environment Canada, the Toxicology Fund of World Wildlife Fund Canada and Ellis Bird Farm Ltd. Through the Federation of Alberta Naturalists, Norcen Energy Resources Ltd. is supplying funding to establish a trail near one of its gas plants near St. Albert. The Junior Forest Wardens of Morinville are maintaining and monitoring this trail.

The future aim of the program is to continue monitoring; support the establishment of new nest box trails and the awareness of ecology and agriculture which they bring; and continue research into pesticides and avian reproductive success and foraging behaviour. Anyone interested in participating with a new or existing nest box trail is asked to contact the authors at the address below or phone (403)939-5858. You may include as many or as few nest boxes from your trail as you wish.

Authors' Address:
P.O. Box 3333, Morinville, Alberta T8R 1S2.

FAN Directors Board Meeting and Field Trips in Stettler, Alberta

September 17 & 18, 1994

Carol L. Simpson

While the FAN Directors held their meeting at the Stettler Recreation Centre on Saturday, September 17, 11 enthusiastic hikers enjoyed a field trip to Rochon Sands Provincial Park and nearby Scenic Sands. Charlie Bird and Garnet Stark were the knowledgeable team leaders. It was a full day of sites and beautiful fall colors. Shaggy mane mushrooms *(Copinus comatus)* were seen along the trails, and a flock of about 40 White-winged Scoters was observed on Buffalo Lake. The Starks graciously invited everyone to their lovely home on the lake, where the group ate lunch and had a well-deserved rest.

The weather couldn't have cooperated better and most of the people returned to the Stettler Recreation Centre in time to get ready for the potluck supper arranged by the Buffalo Lake Naturalists group. Charlie Bird did the honour of saying grace, and 40 participants filled up on a very delicious dinner.

Following dinner, Dan Wood entertained with an excellent slide presentation on prairie ecology and Burrowing Owls. The evening ended with an interesting prize draw--the prizes included a log suet feeder, BLN hat and a bluebird house.

On Sunday, September 18, Mark MacNaughton of Ducks Unlimited led 21 people (nine vehicles) on a trip to inspect some of the North American Waterfowl Management projects. The weather was very windy, but with Mark's encouragement the group visited four sites, each employing different strategies to provide nesting cover. It was also interesting to learn the role local farmers play in protecting the waterfowl population.

After having lunch on a high hill, surrounded by aspen, and out of the wind, most of the visitors started for home. However, Jim Lange, Lloyd Lohr and Graeme and Lloyd Greenlee walked the hilly pasture for two hours. They found 22 species of flowering plants as well as ripe raspberries and strawberries. A Sharp-shinned Hawk and an Orange-crowned Warbler, as well as Yellow-rumped Warblers and a White-crowned Sparrow, were the highlights of the 23 bird species seen.

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Snowy Egret

Phil Boston

The Snowy Egret *(Egretta thula)* is a bittern-sized, white heron with black bill, black legs and yellow feet. It has trailing white plumes that were highly prized when the wearing of feathers was fashionable, and has had to recover from the wholesale slaughter of that period.

Normally, this egret breeds from the southern United States south to Chile and Argentina. Non-breeding birds are known to be great wanderers, however, and they sometimes appear in southern Canada (Salt and Salt 1976). The species is considered to be a vagrant in Alberta (Semenchuk 1992).

Two years ago, on 30 October 1992, I photographed one of these birds on Moose Lake, west of Jasper. The photograph, with brief explanation, appeared in the winter 1992 issue of the *AN.*

Two years later to the day (30 October 1994), I again photographed a Snowy Egret, this time at Jessie Lake, a wildlife sanctuary within the town limits of Bonnyville. Other sightings have been reported at Pincher Creek, Sandy Lake, Irricana and near Camrose (Salt and Salt 1976); also at Pakowki Lake, Frank Lake and Crow Indian Lake (Pinel et al. 1991).

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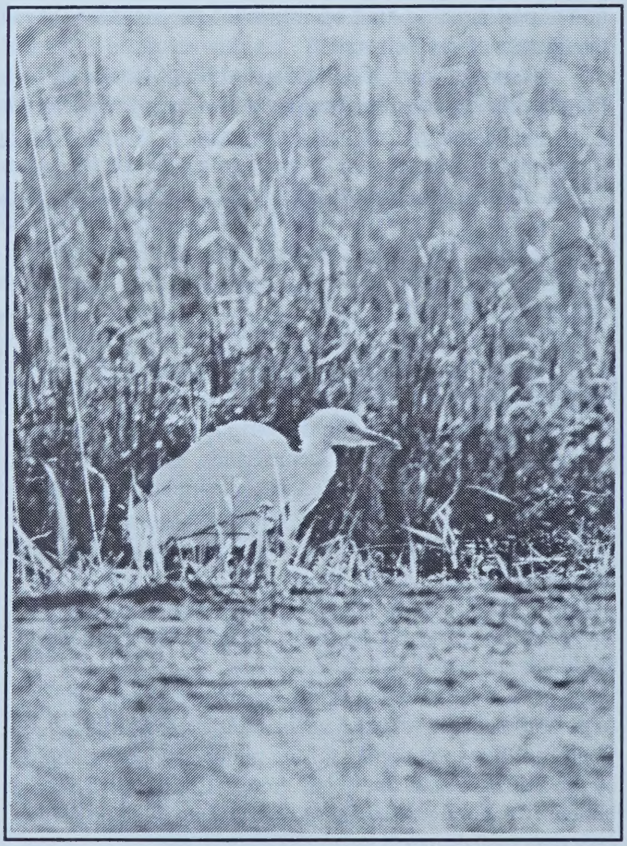

Snowy Egret at Jessie Lake Photos by Phil Boston

Author' s Address:
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Announcements

Alberta Native Legume Assists Reclamation

Alberta Environmental Centre in Vegreville and Wild Rose Consulting Inc., Edmonton, Alberta have collaborated in the collection, evaluation and selection of native legume species for reclamation and restoration at high elevations during the past four years.

The need for adapted plant species for reclamation at high elevations is due to increased extraction of natural resources (coal mining, oil and gas, and forestry) and a heightened public awareness of the need to preserve our native species. Native legume species adapt well in the harsh environment and have the ability to increase soil nitrogen, a particularly important factor in reclaiming disturbed sites. Use of these species protects and maintains the natural biodiversity at high elevations.

In 1990 and 1991, 14 indigenous legume species were collected at 41 sites in seven different foothills and mountain locations from Waterton to Grande Cache. Seeds were cleaned and sown in the greenhouse during the winter months. Plants were hardened off and transplanted into a nursery plot at the Centre. Survival, vigour, spread, growth habit, phenology, seed yield and germination data were collected and evaluated at the Alberta Environmental Centre over three years.

The most highly recommended species for use in reclamation and restoration of disturbances on the Eastern Slopes was alpine milkvetch, *Astragalus alpinus* L. This legume is widely distributed in the foothills and mountains, and in northern Alberta (it has a circumpolar distribution). It produces a large number of viable seeds, and once established, spreads quickly by rhizomes. Late yellow locoweed, *Oxytropis monticola* A., and showy locoweed, *Oxytropis splendens* Dougl. ex. Hook, also performed well in the evaluation. Late locoweed had high overall survival and was a prolific seed producer.

Arctic and other rhizobial strains are now being screened for their potential to improve survival and establishment of selected legumes at reclamation sites. Alpine milkvetch seeds were released to Prairie Seeds Inc., and commercial production will commence this spring.

Funding was provided by The Reclamation Research Technical Advisory Committee and Canadian Parks Service. Future work is planned for evaluating legumes from other areas of Alberta particularly grassland and parkland regions.

For more information contact: Ann Smreciu, Wildrose Consulting Inc. (403)461-5950 or Barb Darroch, Alberta Environmental Centre (403)632-820.

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These Videos Are for the Birds!

Peregrine Falcons, the Resplendent Quetzal and Bay-breasted and Black-throated Blue Warblers are just a few of the birds featured in three programs on migratory birds and habitat protection.

Narrated by CBC Morningside's Peter Gzowski, each program features cover artwork by Robert Bateman and tips on what you can do to save habitat for the birds.

"For The Birds" (21 min, 1993) features the Peregrine Falcon, and the people who are bringing it back from the brink of extinction.

"Singing in the Rainforest" (26 min, 1993) gives rare and stunning closeups of wood warblers in their nesting grounds in northern Canada, and on their wintering grounds in Costa Rica.

"Birders of a Feather" (22 min, 1993) features not just birds, but birdwatchers at Beaverhill Lake, Alberta, in Point Pelee National Park, Ontario and at the Monteverde Cloud Forest Reserve, Costa Rica.

Videos are available for home use for $29.95 each (GST included). Public performance, educational or organizational purchase is $49.95 each. Phone toll-free to order 1-800-661-1674 (Shipping and handling $5.25), or contact "For The Birds", 455-12 Street NW, Calgary, Alberta T2N 2Y9. Phone (403)283-6201 Fax (403)283-6214.

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The Discovery Channel

We have a unique (and free!) opportunity to promote our activities on television.

Discovery Channel will run a regular half-hour program on Thursday evenings called "Heaven and Earth". The program will feature three or four activities each week that are taking place across the country. The topics will include natural history, astrology, etc.

The Canadian Nature Federation has been asked to submit activities that may be appropriate topics for the program. It would like to pass this opportunity on to you, as well.

If you or any of your local affiliates has activities that it would like to promote on the program, please let CNF know. CNF will fax a brief description to Discovery Channel and later follow up on those activities the channel is most interested in. The show has a low budget so any slides or film footage would be appreciated.

For information contact Lesley J. MacGregor, Director, Marketing and Communications, Canadian Nature Federation, 1 Nicholas Street, Suite 520, Ottawa, Ontario K1N 7B7. Phone (613)562-3447 Fax (613)562-3371.

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Supplement Number 7 Alberta Naturalist Volume 24, Number 1

Results of the 1993 May Species Count - Plants in Flower

What Was It? - Interesting Bird Sightings in Alberta

Bumble bee on dandelion flower Photo: J. Derek Johnson

Results of the 1993 May Species Count - Plants in Flower

J. Derek Johnson

Following are the results of the botanical portion of the 1993 May Species Count, held May 29-30. The areas from which reports were received have been listed in approximate latitudinal order from south to north. Stettler was back on stream this year after missing the count for the first time ever in 1992. High Level had its first formally organized count this year. I hope this is the start of a series of annual reports from this area. Scientific nomenclature in this report follows Moss (1983); most common names have been taken from Looman and Best (1979).

It was another record-setting year for the count in 1993. The number of reports was down from a record high of 59 in 1992 to 49 this year, but the reports submitted included a record 79 localities. The number of participants was at an all-time high of 228, far surpassing the previous record of 132 in 1990. The number of species reported in flower was 485, well above last year's record of 437. Record highs for the number of species seen in flower were set or tied at Waterton, Whiskey Gap, Lethbridge, Medicine Hat, Banff/Canmore and Red Deer. Many other areas were near record high totals and only Stettler was below average. The 200 species barrier was broken for the first time with Whiskey Gap reporting 203, a record high for a single count. Waterton Lakes National Park had the second highest total at 173, with the Yamnuska/Bow Corridor region coming third with 167 species.

Weather on the count weekend was variable across the province. Areas north of Red Deer had one of the nicest count weekends in many years, but many areas in the south experienced a fair amount of rain, at least on Saturday. Spring conditions were comparable to 1992. Central and northern areas were about a week ahead of average; southern areas were at least two weeks ahead of average. The two days of 30° C plus temperatures in some parts of Alberta during the second week of May brought about an explosion of flowers in many of the shrubby species and may have contributed to some of the unusual species reported in several areas. Spring moisture conditions were better in extreme southern Alberta this year as most of the grass specimens submitted were green and fresh-looking, as opposed to last year when most were brown and dried out.

The large number of later-flowering species seen, often in more than one area, showed the earliness of the season. Species not normally reported in flower in an average year, let alone from more than one area, included: *Urtica dioica* (common nettle) from 4 areas, *Geum rivale* (purple avens) from 3 areas, roses from 13 areas, *Rubus idaeus* (wild red raspberry) from 6 areas, *Oxytropis monticola* (late yellow locoweed) from 2 areas, *Heracleum lanatum* (cow parsnip) from 3 areas, *Pyrola asarifolia* (common pink wintergreen) from 3 areas, *Ledum groenlandicum* (common Labrador tea) from 8 areas, *Menyanthes trifoliata* (buck-bean) from 4 areas, *Campanula rotundifolia* (harebell) from 2 areas, *Achillea millefolium* (common yarrow) from 11 areas, and *Heterotheca villosa* (golden aster) from 4 areas. One surprise, as far as the number of early flowering records is concerned, is that *Galium boreale* (northern bedstraw) was only seen in flower in 3 areas, compared to 11 for common yarrow. Northern bedstraw normally comes into flower at least 10 days before common yarrow (Bird 1982).

The all-time species list for the May Count never remains static. Twenty-five new species were added to it this year, with 11 of them coming from Waterton Lakes National Park. This is 39 new species from Waterton alone over the past five years. New species included: *Allium geyeri* (Geyer's onion), *Calochortus apiculatus* (mariposa lily), *Xerophyllum tenax* (bear-grass), *Suksdorfia ranunculifolia* (suksdorfia), *Tiarella unifoliata* (false mitrewort), *Rubus parviflorus* (thimbleberry), *Menziesia ferruginea* (false azalea), *Penstemon lyallii* (large-flowered beardtongue), *Orobanche uniflora* (one-flowered cancer-root) and *Antennaria racemosa* (racemose everlasting) from Waterton Lakes National Park, *Vaccinium membranaceum* (tall bilberry) from Waterton and Burnstick Lake southwest of Caroline, *Minuartia nuttallii* (Nuttall's sandwort) from Mt. Gladstone north of Waterton Park, *Astragalus robbinsii* (Robbins' milk vetch) from Mt. Gladstone, Whiskey Gap and Banff, *Glycyrrhiza lepidota* (wild licorice) and *Petalostemon purpureum* (purple prairie clover) from Medicine Hat, *Ranunculus pedatifidus* (northern buttercup) from Calgary, *Carex paupercula* (bog sedge) from Yamnuska, *Polygonum viviparum* (alpine bistort) and *Oxytropis podocarpa* (inflated oxytrope) from the Bow Corridor, *Campanula rotundifolia* (harebell) from the Bow Corridor and Grande Prairie, *Tofieldia pusilla* (dwarf false asphodel), *Arenaria longipedunculata* (sandwort) and *Minuartia dawsonensis* (Dawson sandwort) from Banff, *Carex stipata* (awl-fruited sedge) from Edmonton, and *Cardamine pratensis* (meadow bitter cress) from Fort McMurray. The reports of bog sedge, dwarf false asphodel, sandwort, Dawson sandwort, Nuttall's sandwort, meadow bitter cress, and Robbins' milk vetch were supported by specimens.

Spring weather conditions and where people go to do their counts have a major bearing on which species are reported in flower. I always find it interesting when a species never reported on the May Count before shows up in more than one area. Such was the case this year with Robbins' milk vetch. Not only is it new to the count, but it showed up in three areas. What is even more remarkable is that all three reports were supported by a specimen.

The prize for the most noteworthy new species has to go to Fort McMurray for their report of meadow bitter cress. Although Waterton came up with more new records, they are species which are known from the park. The report of meadow bitter cress from Fort McMurray fills part of a large gap in this rare species' distribution between records to the north and south of it.

Harebell has been reported in flower before on the May Count, but I discounted these records as unreliable because the species does not normally flower until late June. This year it was reported in flower from two widely separated areas, and because of the earliness of the season, I have decided to accept these records with reservation.

Thirty species either considered to be rare in Alberta by Packer and Bradley (1984) or rare in Canada by Argus and Pryer (1990) were found on the 1993 count. This is the most ever in the history of the May Count. Many of these are regulars on the counts in some areas (see Johnson 1991). Rare species reported for the first time include: *Allium geyeri* (Geyer's onion), *Calochortus apiculatus* (mariposa lily), *Xerophyllum tenax* (bear-grass), *Suksdorfia ranunculifolia* (suksdorfia) and *Orobanche uniflora* (one-flowered cancer-root) from Waterton Lakes National Park, *Minuartia nuttallii* (Nuttall's sandwort) from Mt. Gladstone, *Arenaria longipedunculata* (sandwort) from Banff, and *Cardamine pratensis* (meadow bitter cress) from Fort McMurray. In addition, *Conimitella williamsii* (conimitella) was reported from Whiskey Gap for the first time since 1987 and *Scirpus nevadensis* (Nevada bulrush) was reported from Buffalo Lake for the first time since 1985. *Osmorhiza chilensis* (blunt-fruited sweet cicely) was reported from Waterton for the first time. It has been a regular on the Cypress Hills count for several years.

Last year, *Smilacina stellata* (star-flowered Solomon's-seal) had the distinction of being the only native species reported from all count areas. This year, no species had that honour. The species that came the closest were *Fragaria virginiana* (smooth wild strawberry) and *Prunus virginiana* (black-fruited choke cherry), each absent from only one of the summarized count areas.

Several species had particularly abundant flowering this year compared to most. *Allium textile* (prairie onion) was flowering profusely in many areas, but it still came up short of 1985 when almost everyone who listed it mentioned how conspicuous it was. *Arnica fulgens* (shining arnica) had its best showing ever, being recorded from four areas, and it rated special mention for abundance in two of them. *Allium schoenoprasum* (wild chives) was reported in flower from two areas. This is the first time it has been reported in flower since 1981. The distinction of having the longest gap since last being reported in flower falls to *Tofieldia glutinosa* (sticky false asphodel). It was seen in two widely separated areas. The last time it was seen in flower was in 1978 in the Grande Prairie area.

The mysterious disappearance of *Astragalus drummondii* (Drummond's milk vetch) on last year's count is even more surprising when the results from this year are considered. The species was seen in six different areas this year (including Dry Island Buffalo Jump Provincial Park), and at Rumsey, some hillsides were conspicuously ablaze with the yellowish-white flowers of this species. Strange how it was missed in 1992 when spring conditions the past two years were so similar.

Alopecurus pratensis (meadow foxtail) may become the grass equivalent of scentless chamomile. It was first reported in flower on the May Count in 1988 from Whiskey Gap and Edmonton. In later years it has been reported from Fort McMurray, Mayerthorpe and Entwistle. It has become a regular on the Whiskey Gap and Edmonton counts. This year it showed up on the count from Calgary. Where will it pop up next?

Hyoscyamus niger (black henbane), an uncommon weedy species in the nightshade family, showed up on a record three counts this year. The report from Edmonton is the first for the area and the first from north of Red Deer.

My listing of *Erigeron scotteri* (cliff daisy) from the Yamnuska area last year proved to be a somewhat unpopular choice with some botanists. It was suggested that it would be more in line with current taxonomic thinking to list the species as *E. acris* (northern daisy fleabane) as Moss (1983) does. I have made this change for future reporting.

With increasing numbers of participants and greater area coverage, it is becoming more and more of a challenge to sort through the annual count results. This year was no exception. I did not have the time to check all of the questionable records submitted. Even allowing for the earliness of the season, there were several impossible species reported in flower this year.

Following is a list of observers, area totals (1992 in brackets), and other pertinent remarks for each area.

1. Waterton Lakes National Park: Three counts, including six participants, were conducted in the park. Park interpreter Janice Smith and Waneeta Fisher encountered 82 (67) species in the townsite area, Red Rock Canyon, Bertha Lake Trail, and Cameron Lake. George and Etta Scotter visited some of the same areas as Janice and Waneeta, as well as the Buffalo Paddock and the Blakiston Falls Trail, gathering an impressive 140 species in flower. Gordon and Hazel Ross submitted a list from the lower Red Rock Canyon road that included 63 (55) species. The total for the park was 173 (130), a record high for the area. This is an impressive total, especially considering it includes only four grasses, one willow and no sedges.

2. Mt. Gladstone/Mill Creek: J.F. Dormaar traversed Mill Creek and the slopes of Mt. Gladstone, north of Waterton Park, reporting 66 species in flower.

3. Whiskey Gap: A phenomenal 203 (170) species were reported from this area, the most ever for a single count. George and Etta Scotter and Barbara and Lynn Sommerfeldt were the observers. Second time May Count records included *Erodium cicutarium* (stork's-bill) and *Linaria dalmatica* (broad-leaved toad-flax), first reported from this area in 1990 and 1987, respectively.

4. Lethbridge and area: Four counts, including five participants, were submitted from this area. Katharine Russell listed 20 species in flower from the Russell farm 5 km south of Lethbridge. Six Mile Coulee was covered by Bob Hall. He reported 49 species in flower. The old Fort Whoop-up site south of Lethbridge revealed 38 species in flower to Gordon and Hazel Ross. Lloyd Bennett did his third count in the Taber area finding 69 (44) species in flower. The total for the Lethbridge area was 98 (71), 14 species more than the previous record of 84 set in 1985. Second time May Count records of *Cleome serrulata* (bee plant) and *Vicia cracca* (tufted vetch) came from the area this year. These were first reported in flower from Medicine Hat and Edmonton, respectively, in 1988.

5. Cypress Hills Provincial Park: Two groups reported 110 (119) species in flower. This is the second highest total for the park in the 10 years that a count has been done in the area. Margaret and Anton Walker and Doug and Sue Macdonald submitted a list of 70 (81) species from a survey of the Elkwater to Reesor Lake area on a very miserable Saturday. George and Etta Scotter came upon 87 species along the north boundary of the park on June 1.

6. Medicine Hat: Dennis Baresco compiled a list including 24 participants and 68 (64) species in flower, setting a record for the area. The other participants were: Barb and Ron Chisholm, Bob Frew, Corlaine and Rob Gardner, Phil Horch, Mike Horvath, Hope Johnson, Lex Karne, Sandra Korbelik, Carolyn Kury, Phyllis MacDonald, Jim and Lorine Marshall, Garry Newton, Dorothy Robertson, Gretton and Veronica Swan, Evelyn Tate, Bill and Ruth Tidy, and Ben and Michael Velner. Second time May Count records from this area included: *Cymopterus acaulis* (plains cymopterus), first reported from Lethbridge in 1985, *Apocynum cannabinum* (Indian hemp), first reported from the Milk River and Medicine Hat in 1988, and *Penstemon gracilis* (lilac-flowered beardtongue), first reported from Medicine Hat in 1989.

7. Calgary and area: Three reports, covering five areas, came from Calgary this year. Three were from within the city and two were from outside. In the city, Don Stiles listed 25 species from Nose Creek and 42 (38) from the Bow River below Queensland. Ann Brebner and Beryl Hallworth came up with a count of 57 (35) species from the University Reserve. Outside the city, Don Stiles recorded 26 species from Horseshoe Canyon near Drumheller and 30 species from the Carbon Natural Area. The total for the Calgary area was 91 (97) species.

8. Yamnuska/Bow Corridor: The geographic area that this count encompasses continues to expand as more participants take part in the May Count. Three reports, covering 11 localities, were submitted this year. The annual count in the Yamnuska area by the Bow Valley Naturalists resulted in a list of 117 (95) species in flower, only two short of the 1987 record of 119. Participants on this count included: Moragh Dornian, Jean Greig, Patricia Grayling, Deb Hornsby, Diane (compiler) and Mike McIvor, and Bob and Mary Smith. Observations by Derek Johnson, Patsy Cotterill and others, at the Yamnuska YMCA during the Volunteer Steward Conference on June 5 compiled a list of 68 species in flower. A summary report compiled by Janet Rodgers, encompassing nine localities in the Bow Corridor, included 105 species. Dick and Miki Mann walked the shores of the Bow River finding 24 species in flower. Highways 1A and 1X, Exshaw and Seebe were covered by Janet Rodgers and Rosie Reid who reported 32 species in flower. Wayne, Diane, Chelcy and Mandy Scott went to Gap Lake where they saw 14 species in flower. Gap Lake Hill was visited by Marilyn Dyck and Jill Keifer. They found 25 species in flower. Grotto Canyon was home to Bob and Ruth Camenzind for the day, where they recorded 43 species in flower. Janet and Michael Brygger travelled to Jura Creek reporting 27 species in flower. Paul and Emily Smith, Bente Preshaw, Donna MacKay, and Linda Davis included Lac Des Arcs as their count area, finding 19 species in flower. Three groups went to Bow Valley Provincial Park. Wayne, Diane, Chelcy and Mandy Scott saw 34 species, Roy Preshaw found 11, and Mandy Kopp, Susanah Windrup, Scott Mair, and Steve Jarand listed 45 species in flower. Barrier Lake was also visited by three groups. Myra Wiebe and Kirstin Olson recorded 30 species, Paula Rodrigues saw 17, and Eva Zidek, Heather Ashley, and Kate Billingham reported 38 species in flower. The total for this region was 167 (111) species.

9. Banff/Canmore/Wind Ridge: A better than average turnout of 17 participants for this count resulted in a list of 129 (95) species in flower, tying the 1987 record. Chrystel Balint, Amy, Anne and Bruce Bembridge, Heather Dempsey, John Firth, Eleanor and Marjory Gibney, Jean Greig, Diane (compiler) and Mike McIvor, Donna McKeown, Mike Potter, Bob and Mary Smith, Gareth Thompson and Keith Webb submitted observations.

10. Rumsey Aspen Parkland: Observations from the Tolman Bridge on the Red Deer River, 15 km east of Trochu and aspen parkland east of Rowley (33-33-19-W4 and 4-34-19-W4) resulted in a list of 69 species in flower. This was the first organized May Count in the area. The 15 participants included: Cheryl Bradley, Carole Calenso-Fair, Judy Cornish, Lorne Fitch, Mr. and Mrs. Dale Gray, Derek Johnson (compiler), Ed Karpuk, Earl Stamm, and six other nameless souls. The showy display of *Astragalus drummondii* (Drummond's milk vetch), and the finding of a few flowering plants of the rare *Viola pedatifida* (crowfoot violet) were the highlights of this count.

11. Red Deer and area: Four counts, covering four areas, were submitted from Red Deer. The Kneehill Valley east of Innisfail was covered by Dorothy Dickson. She reported 39 species in flower. Stewart and Irene Ford, Herb and Helen Harris (compiler), Dorothy Hazlett, Beth Peck, and Tom Pierce recorded 64 species from Pine Lake, southeast of Red Deer. Myrna Pearman submitted some observations from Norglenwold on Sylvan Lake. They were included with Helen Harris' report. Finally, Doug Taylor and a group of cottage owners from Burnstick Lake, southwest of Caroline, came up with a list of 49 (44) species in flower. The other participants were: Lloyd and Beth Cumming, Gerry and Peggy Kadey, and Bill and Cindy Post. The number of species for the Red Deer area was 79 (58), six better than the previous record of 73 set in 1983.

12. Buffalo Lake: A single report, covering two areas, was received. Charley Bird and Garnet Stark went to Scenic Sands, on the south side of Buffalo Lake, where they found 42 species in flower. The Buffalo Lake Naturalists did their count in the general Stettler area, coming up with 14 species in flower. The 12 participants here were: Bertha Clark, Trudie Grafe, Gladys and Wilf Hewlett, Lloyd Lohr (compiler), Martha and Ron Kruger, George and Grace Neill, and Carol, Davis and Les Simpson. The number of species for the area was 53.

13. Wainwright Dunes Ecological Reserve: A visit to the reserve, in the area north and northwest of David Lake, revealed 74 species in flower to Derek Johnson. A count was done in this area on June 7, 1992, when 75 species were found in flower. The species lists are comparable between the two years. The major difference is in the percentage of plants in flower, as the count in 1992 was done 10 days later than the one in 1993, with similar spring conditions in effect.

14. Coyote Lake: Doris Hopkins reported 40 (32) species in flower from this nature sanctuary approximately 67 km west of Leduc. This is the best result in the four counts that have been done in the area.

15. Edmonton and area: Edmonton was one of the few areas to show a decline in participation in 1993. Eight reports, including 17 participants, were received this year, compared to last year's 12 reports and 21 participants. However, the number of species seen in flower was up marginally from last year to 152 (150). Five reports came from within the city and three from outside.

Within the city, the annual pilgrimage along Whitemud Creek from 23rd to 45th Avenue picked up 59 (51) species in flower. Elisabeth Beaubien, Derek Johnson (compiler), Kim Krause, Carla Palaschuk and Sandra were the observers. Frank Rusconi covered the North Saskatchewan River valley from the Capilano Bridge to the Beverly foot bridge finding 38 species in flower. The river valley near the Dawson Bridge was visited by Catherine and Janis Reininger who reported 19 species in flower. Patsy Cotterill was again much travelled, visiting many areas within and beyond the city. Her visit to Little Mountain Cemetery in north Edmonton came up with 38 (38) species in flower. A tour of parts of the University of Alberta campus and the "Devil's Leap" area along Whitemud Creek revealed 33 species.

Outside the city, the annual count in the Wagner Natural Area, west of Edmonton, came up with 80 (52) species in flower, one of the best counts ever in the area. Participants included: Diana Barager, Pat Clayton, Patsy Cotterill (compiler), Leota Cummins, Alice Hendry, and Tara Normand. The Clifford E. Lee Nature Sanctuary near Devon was included in Patsy Cotterill's travels where she located 47 (31) species. Judy Fairweather and Linda Kershaw covered the Fairweather and Kershaw acreages in the Hastings Lake area east of Edmonton, reporting 45 (28) species in flower.

In addition to black henbane, first time records for the Edmonton area included *Camelina microcarpa* (small-seeded false flax) and *Linum lewisii* (Lewis' wild flax).

16. Entwistle/Glenevis/Campbell Springs: The fifteenth annual count in the area surrounding Hoople Lake, 8 km SSE of Entwistle, came up with a total of 74 (77) species in flower, tying it for second best in this count's history. Derek Johnson (compiler), Bob Langill and Steve Zoltai were the observers. There were two interesting records on the count in this area. *Trientalis borealis* (northern starflower) was found for only the second time, in exactly the same spot where it was seen in 1981. *Valeriana dioica* (northern valerian) was also found for the second time, in this case, about 400 m east across a plowed field from where it was first found in 1981. The fifth count conducted on the George Pegg property near Glenevis reported 50 (67) species in flower. Lesley and Vera Brown, Trish Clague, Patsy Cotterill (compiler), Dave and Ewen Cuthiell, and Katie and Rayma Peterson were the observers. A second visit to Campbell Springs, 11 km north of Mayerthorpe, in conjunction with the count on the Pegg property, came up with 38 (24) species. Participants included: Mary Brazell, Lesley Brown, Patsy Cotterill (compiler), Dave and Ewen Cuthiell, and Katie and Rayma Peterson. The total for this broad area northwest of Edmonton was 100 species.

17. Lac La Biche/Athabasca/Hanmore Lake: The F.A.N. Spring Meeting was held in Lac La Biche this year and observations from the townsite, the Lac La Biche Mission and a circle of the lake on Secondary Road 858 between May 22-24 resulted in a list of 46 species in flower. Derek Johnson and Don Stiles provided most of the observations. The most interesting record was that of *Carum carvi* (caraway) from a roadside ditch on the west side of the lake. This is only the third report for the May Count, and the first since 1988. An impressive total of 19 participants took part in the second Athabasca area count organized by Merilyn Peruniak. This group visited 3 areas and came up with a total of 45 species in flower. The immediate Athabasca area, including Forfar Park, Canoe Lake and Hope Lake, was covered by Ann and Garth Edwards, Jim Lange, Blair, Geoff and Kyle Lindsay, Merilyn and Ryan Peruniak, Ann Stiles and Courtney, Luke, Sheena and Riley Taggart. Here they found 31 species in flower. Elaine, Rita, Terra, Marcia and David Birkigt and Merilyn and Lindsay Peruniak toured the Pine Sands Natural Area, northeast of Athabasca, and listed 30 (29) species in flower. A solo visit by Merilyn to the Pine Creek area, east of Athabasca, encountered 22 species in flower. A very brief visit to Hanmore Lake, north of Smoky Lake, by Derek Johnson, came up with 19 (28) species in flower. The total for the region was 68 species.

18. Grande Prairie and area: Five reports, including five areas and eight participants, were received this year. The annual survey of their farm northeast of Wembley, by Gavin and Ellen Craig, found 53 (61) species in flower. Jeanne Smith and Ken Nash visited Kleskun Hills Park, northeast of Grande Prairie, seeing 33 species in the process. The general Beaverlodge area was covered by Maxine and J. Brown who reported 20 species in flower. Maxine and Terri Brown found 20 species in flower in the Elmworth area, southwest of Beaverlodge. Finally, Jeanne Smith and Marie Cliff recorded 27 species in flower at Bear Creek Park on the southern boundary of Grande Prairie. The number of species for the area was 75, the second highest total in this count's history.

19. Fort McMurray: There was again an excellent turnout for this count. Thirteen participants saw a total of 92 (78) species in flower, a tie for third best in this count's history. Bill Bloomfield, Wendy and Damian Burry, Sandra Campbell, Angela De Silva, Marion Horrocks (compiler), Ruth Kleinbub, Fred Korbut, David Mark, Helen Pachalco, Debbie Skaar, and Maria and Sarah Vyboh were the participants.

20. High Level and area: A well-organized count in this area, orchestrated by Karen Herrmann, had observations from no fewer than 19 localities in the Footner Lake Forest. The twenty-two participants came up with an impressive total of 75 species in flower. Summarizing the localities and number of species: Jason (Foggy Fire Tower) 19, Kate and Stuart Carter (Rainbow Fire Tower) 7, Jackie (Basset Fire Tower) 4, Ken Orich (Adair Fire Tower) 2, Roger P. (Amber Fire Tower) 2, John Richardson (Petitot Fire Tower) 7, Tony (Wadlin Fire Tower) 6, Kelly (Steen Fire Tower) 1, Karen Herrmann, Andy Miller and Lisa and Chris (Boreal Research Station along the Peace River southwest of Fort Vermilion) 14, Katrina Wilson (Child Lake Salt Meadows) 7, Steve B. (south of Peace River western boundary of Wood Buffalo National Park) 1, Ian Wallis (Highway 35 south of Slavey Creek) 1, Cindy and Eileen Mitchel (Highway 58 west of High Level) 11, Ken Orich (Footner Lake) 19, Karen Herrmann and Henri Souloudre (Peace River WSW of La Crete) 11, Karen Herrmann and Steve B. (Machesis Lake) 18, Karen Herrmann, Therese Yachtyshyn and Joanne Pottage (Highway 58 east of Rainbow Lake) 25, Tracy Stewart (Assumption) 1, and J.P. Bielech (Highway 35 Hotchkiss River crossing) 10.

The 1994 count will be held on the weekend of May 28-29.

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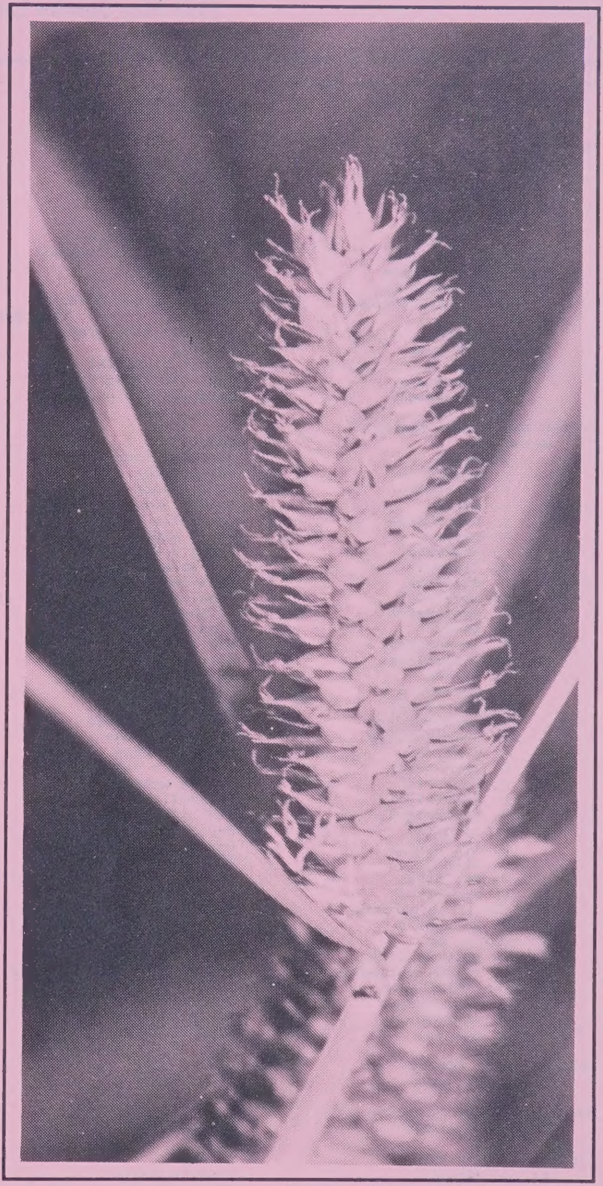


Carex utriculata (Beaked sedge) Photo: J. D. Johnson

1993 May Species Count: Plants in Flower

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
JUNCAGINACEAE (Arrow-grass Family)																					
Triglochin maritima	Seaside Arrow-grass			x									x			x	x				x
T. palustris	Slender Arrow-grass									x											x
GRAMINEAE (Grass Family)																					
Alopecurus aequalis	Short-awned Foxtail																x				
A. occidentalis	Alpine Foxtail			x																	
A. pratensis	Meadow Foxtail	x		x				x								x	x				
Bromus tectorum	Downy Chess	x																			
Elymus innovatus	Hairy Wild Rye															x					
E. junceus	Russian Wild Rye				x																
Festuca scabrella	Northern Rough Fescue	x				x		x	x		x										
Hierochloe odorata	Sweet Grass			x				x	x	x	x					x	x	x		x	
Koeleria macrantha	June Grass	x				x															
Oryzopsis asperifolia	White-grained Mountain Rice Grass					x											x			x	
O. pungens	Northern Rice Grass															x				x	x
Phleum pratense	Timothy															x					
Poa annua	Annual Bluegrass								x							x	x	x			
P. pratensis	Kentucky Bluegrass				x									x		x					
P. sandbergii	Sandberg's Bluegrass			x																	
CYPERACEAE (Sedge Family)																					
Carex spp.	Sedges				x			x													
C. aenea	Silvery-flowered Sedge					x					x					x					
C. aquatilis	Water Sedge			x		x			x		x			x		x	x	x		x	
C. atherodes	Awned Sedge			x												x					
C. aurea	Golden Sedge												x	x		x					
C. capillaris	Hair-like Sedge									x				x		x	x				
C. curta	Short Sedge																x				
C. deweyana	Dewey's Sedge															x	x				
C. diandra	Two-stamened Sedge													x		x					
C. disperma	Two-seeded Sedge															x	x				
C. douglasii	Douglas Sedge			x							x										
C. gynocrates	Northern Bog Sedge															x				x	
C. hoodii	Hood's Sedge			x																	
C. lanuginosa	Woolly Sedge			x		x					x		x								
C. lasiocarpa	Hairy-fruited Sedge													x		x					
C. livida	Livid Sedge															x					
C. norvegica	Norway Sedge															x					
C. paupercula	Bog Sedge								x												
C. pensylvanica	Sun-loving Sedge			x																	
C. praegracilis	Graceful Sedge			x		x					x			x			x				
C. prairea	Prairie Sedge															x					
C. raynoldsii	Raynold's Sedge			x																	
C. rostrata	Beaked Sedge			x		x			x					x		x	x				
C. sartwellii	Sartwell's Sedge			x							x			x		x	x				
C. scirpoidea	Rush-like Sedge								x	x											
C. siccata	Hay Sedge								x				x	x		x	x	x		x	x
C. sprengelii	Sprengel's Sedge			x					x				x			x					
C. stipata	Awl-fruited Sedge															x					
C. vaginata	Sheathed Sedge									x						x	x				
C. xerantica	White-scaled Sedge			x		x															
Eleocharis acicularis	Needle Spike-rush			x														x			
E. palustris	Creeping Spike-rush			x		x			x		x			x		x	x				
Eriophorum sp.	Cotton Grass																		x		x
E. polystachion	Tall Cotton Grass															x	x				
E. viridi-carinatum	Thin-leaved Cotton Grass									x						x					
Scirpus cespitosus	Tufted Bulrush								x					x		x	x				
S. microcarpus	Small-fruited Bulrush													x							
S. nevadensis	Nevada Bulrush												x								
S. pumilus	Dwarf Bulrush									x						x	x				
ARACEAE (Arum Family)																					
Calla palustris	Water Calla														x				x		
JUNCACEAE (Rush Family)																					
Juncus albescens	White Rush									x											
LILIACEAE (Lily Family)																					
Allium geyeri	Geyer's Onion	x																			
A. schoenoprasum	Wild Chives								x										x		
A. textile	Prairie Onion	x		x	x	x	x	x			x		x	x							
Calochortus apiculatus	Mariposa Lily	x																			
Camassia quamash	Blue Camas	x		x																	
Disporum hookeri	Oregon Fairybells	x																			
D. trachycarpum	Rough-fruited Fairybells	x	x	x		x			x	x		x		x		x	x	x	x	x	x
Erythronium grandiflorum	Glacier Lily	x	x																		
Fritillaria pudica	Yellow-bell			x																	
Maianthemum canadense	Wild Lily-of-the-Valley											x		x	x	x			x	x	
Smilacina racemosa	False Solomon's-seal	x	x	x				x	x						x				x		
S. stellata	Star-flowered Solomon's-seal	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x		x	x	x
S. trifolia	Three-leaved Solomon's-seal															x	x				x
Tofieldia glutinosa	Sticky False Asphodel								x												x
T. pusilla	Dwarf False Asphodel									x											
Xerophyllum tenax	Bear-grass	x																			
Zigadenus venenosus	Death Camas	x		x		x		x	x		x										
IRIDACEAE (Iris Family)																					
Sisyrinchium montanum	Common Blue-eyed Grass	x	x	x	x	x		x	x	x	x	x	x		x	x	x		x	x	
ORCHIDACEAE (Orchid Family)																					
Calypso bulbosa	Venus-slipper	x	x			x			x	x		x								x	x

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Corallorhiza striata	Striped Coralroot	x				x			x												
C. trifida	Early Coralroot	x		x				x	x	x		x				x	x		x	x	x
Cypripedium calceolus	Yellow Lady's-slipper								x			x									
C. montanum	Mountain Lady's-slipper	x																			
Habenaria hyperborea	Northern Green Bog Orchid									x											
H. obtusata	Blunt-leaved Bog Orchid								x											x	
H. viridis	Long-bracted Orchid			x				x	x												
Listera borealis	Northern Twayblade																			x	
L. cordata	Heart-leaved Twayblade	x														x					
Orchis rotundifolia	Round-leaved Orchid																x				
SALICACEAE (Willow Family)																					
Salix spp.	Willows								x												
S. bebbiana	Beaked Willow			x						x				x		x	x	x		x	x
S. brachycarpa	Short-capsuled Willow									x											
S. exigua	Sandbar Willow	x		x		x	x	x			x					x					x
S. lucida	Shining Willow							x								x	x	x			
S. lutea	Yellow Willow							x													
S. maccalliana	Velvet-fruited Willow															x		x			
S. pyrifolia	Balsam Willow															x	x	x			
BETULACEAE (Birch Family)																					
Alnus crispa	Green Alder								x	x								x		x	
Betula glandulosa	Dwarf Birch																			x	
B. occidentalis	River Birch								x												
B. pumila	Swamp Birch								x												x
URTICACEAE (Nettle Family)																					
Urtica dioica	Common Nettle	x		x					x												x
SANTALACEAE (Sandalwood Family)																					
Comandra umbellata	Bastard Toadflax	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x
Geocaulon lividum	Northern Comandra									x						x	x			x	x
POLYGONACEAE (Buckwheat Family)																					
Eriogonum flavum	Yellow Umbrellaplant			x	x		x														
E. umbellatum	Umbrellaplant	x	x																		
Polygonum arenastrum	Common Knotweed			x																	
P. bistortoides	Western Bistort	x		x																	
P. viviparum	Alpine Bistort								x?	x?											
Rumex acetosa	Green Sorrel			x																	
R. triangulivalvis	Narrow-leaved Dock			x																	
R. venosus	Sand Dock				x		x														
CHENOPODIACEAE (Goosefoot Family)																					
Atriplex nuttallii	Nuttall's Atriplex			x																	
Chenopodium capitatum	Strawberry Blite													x							
Monolepis nuttalliana	Spear-leaved Goosefoot	x		x		x					x			x							
AMARANTHACEAE (Amaranth Family)																					
Amaranthus graecizans	Prostrate Amaranth								x												
PORTULACACEAE (Purslane Family)																					
Claytonia lanceolata	Western Spring Beauty		x			x															
CARYOPHYLLACEAE (Pink Family)																					
Arenaria capillaris	Linear-leaved Sandwort		x																		
A. congesta	Rocky-ground Sandwort					x															
A. longipedunculata	Sandwort									x											
A. serpyllifolia	Thyme-leaved Sandwort	x																			
Cerastium arvense	Field Chickweed	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x
C. nutans	Long-stalked Chickweed																x				
C. vulgatum	Mouse-eared Chickweed				x	x	x			x							x				
Minuartia dawsonensis	Dawson Sandwort									x											
M. nuttallii	Nuttall's Sandwort		x																		
M. rubella	Red-seeded Sandwort	x	x	x					x	x											
Moehringia lateriflora	Blunt-leaved Sandwort	x	x	x		x		x	x	x		x	x	x	x	x	x		x		x
Silene menziesii	Menzie's Catchfly			x																	
S. pratensis	White Cockle															x					
Stellaria calycantha	Northern Stitchwort															x					
S. crassifolia	Fleshy Stitchwort			x												x					
S. longifolia	Long-leaved Stitchwort					x										x	x				
S. longipes	Long-stalked Stitchwort			x		x		x	x	x	x		x	x		x	x				x
S. media	Common Chickweed	x		x												x					
NYMPHAEACEAE (Water-lily Family)																					
Nuphar variegatum	Yellow Pond-lily																		x		x
RANUNCULACEAE (Crowfoot Family)																					
Actaea rubra	Red Baneberry	x	x	x		x			x	x		x	x	x	x	x	x	x	x	x	x
Anemone canadensis	Canada Anemone							x			x	x			x	x				x	
A. lithophila	Drummond's Anemone		x																		
A. multifida	Cut-leaved Anemone	x	x	x	x	x		x	x	x	x									x	
A. parviflora	Small Wood Anemone								x	x											
A. patens	Crocus Anemone		x	x	x	x			x	x								x	x		x
A. richardsonii	Yellow Anemone									x											
Aquilegia brevistyla	Small-flowered Columbine							x	x	x		x			x	x		x		x	
A. flavescens	Yellow Columbine	x	x						x	x											
Caltha natans	Floating Marsh Marigold																x				x
C. palustris	Marsh Marigold											x			x	x	x	x		x	x
Clematis occidentalis	Purple Virgin's-bower	x	x			x		x	x	x		x			x	x					
Delphinium bicolor	Low Larkspur	x	x	x		x															
Myosurus minimus	Least Mousetail			x																	
Ranunculus abortivus	Smooth-leaved Buttercup				x	x			x							x	x				x

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
R. acris	Tall Buttercup	x		x		x		x	x	x							x				
R. aquatilis	White Water Crowfoot	x																			
R. cardiophyllus	Heart-leaved Buttercup	x		x		x			x		x		x								
R. circinatus	White Watercrowfoot			x	x														x		
R. cymbalaria	Seaside Buttercup			x	x	x	x	x	x	x			x	x		x	x				
R. eschscholtzii	Mountain Buttercup								x												
R. glaberrimus	Early Buttercup	x							x												
R. gmelinii	Small Yellow Watercrowfoot			x								x			x	x		x	x		x
R. inamoenus	Graceful Buttercup	x																			
R. macounii	Macoun's Buttercup			x												x	x				x
R. pedatifidus	Northern Buttercup							x													
R. rhomboideus	Prairie Buttercup				x	x		x	x	x		x				x					
R. sceleratus	Celery-leaved Buttercup			x	x	x						x			x	x	x	x			
Thalictrum occidentale	Western Meadow Rue	x	x																		
T. venulosum	Veiny Meadow-rue	x		x		x		x	x	x	x	x		x	x	x	x	x	x	x	x
Trollius albiflorus	Globeflower	x																			
BERBERIDACEAE (Barberry Family)																					
Berberis repens	Creeping Mahonia	x	x																		
FUMARIACEAE (Fumitory Family)																					
Corydalis aurea	Golden Corydalis			x				x	x	x		x	x	x		x	x	x	x	x	x
CAPPARIDACEAE (Caper Family)																					
Cleome serrulata	Bee Plant				x																
CRUCIFERAE (Mustard Family)																					
Alyssum alyssoides	Small Alyssum			x																	
A. desertorum	Yellow Alyssum	x			x																
Arabis divaricarpa	Purple Rock Cress	x		x		x			x		x			x							
A. drummondii	Drummond's Rock Cress	x	x																		
A. glabra	Tower Mustard	x		x																	
A. hirsuta	Hirsute Rock Cress					x			x	x	x					x				x	
A. holboellii	Reflexed Rock Cress			x			x	x	x	x	x			x						x	
A. lyrata	Lyre-leaved Rock Cress																			x	
A. nuttallii	Nuttall's Rock Cress		x	x																	
Barbarea orthoceras	American Winter Cress			x		x															
Brassica campestris	Bird-rape				x											x					
B. kaber	Wild Mustard			x	x											x					
Braya humilis	Leafy Braya							x		x											
Camelina microcarpa	Small-seeded False Flax			x										x		x					
Capsella bursa-pastoris	Shepherd's-purse	x		x	x	x		x	x	x	x	x				x	x	x	x	x	
Cardamine pensylvanica	Bitter Cress														x	x	x				x
C. pratensis	Meadow Bitter Cress																			x	
Cardaria draba	Heart-podded Hoary Cress				x																
C. pubescens	Globe-podded Hoary Cress			x																	
Conringia orientalis	Hare's-ear Mustard			x	x																
Descurainia pinnata	Short-fruited Tansy Mustard	x		x	x																
D. sophia	Flixweed	x		x	x	x	x	x		x	x			x		x		x			x
Diplotaxis muralis	Sand Rocket								x												
Draba aurea	Golden Draba		x	x?					x	x											
D. cana	White Draba								x	x											
D. lonchocarpa	Draba								x												
D. nemorosa	Annual Draba	x		x					x	x	x		x	x		x		x		x	
D. oligosperma	Few-seeded Draba		x	x						x											
Erucastrum gallicum	Dog Mustard								x												
Erysimum asperum	Western Wallflower						x							x							
E. cheiranthoides	Wormseed Mustard								x	x						x	x				
E. inconspicuum	Small-flowered Prairie Rocket	x		x	x	x		x	x	x											
Hesperis matronalis	Dame's Rocket	x		x			x														
Lepidium densiflorum	Common Peppergrass	x		x			x	x			x										
Lesquerella alpina	Spatulate Bladderpod			x																	
L. arenosa	Sand Bladderpod	x		x	x	x		x			x			x							
Nasturtium officinale	Water Cress			x						x											
Neslia paniculata	Ball Mustard															x					
Physaria didymocarpa	Twin Bladderpod	x							x	x											
Rorippa palustris	Marsh Yellow Cress					x								x		x	x	x			
Sisymbrium altissimum	Tumbling Mustard			x	x			x								x					
S. loeselii	Tall Hedge Mustard							x	x												
Smelowskia calycina	Silver Rock Cress		x																		
Thlaspi arvense	Stinkweed	x		x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	
CRASSULACEAE (Orpine Family)																					
Sedum lanceolatum	Lance-leaved Stonecrop	x		x																	
Tolmachevia integrifolia	Rose-root	x	x						x												
SAXIFRAGACEAE (Saxifrage Family)																					
Chrysosplenium iowense	Golden Saxifrage								x			x			x		x	x		x	
C. tetrandrum	Green Saxifrage																				x
Conimitella williamsii	Conimitella			x																	
Heuchera cylindrica	Sticky Alumroot	x	x	x																	
H. parvifolia	Small-leaved Alumroot	x		x																	
H. richardsonii	Richardson's Alumroot							x													
Mitella nuda	Bishop's-cap								x			x		x	x	x	x	x	x	x	x
M. trifida	Mitrewort	x																			
Saxifraga bronchialis	Spotted Saxifrage	x							x												
S. occidentalis	Rhomboid-leaved Saxifrage	x																			
S. oppositifolia	Purple Saxifrage								x	x											
Suksdorfia ranunculifolia	Suksdorfia	x																			
Tiarella unifoliata	False Mitrewort	x																			
GROSSULARIACEAE (Gooseberry Family)																					
R. americanum	Wild Black Currant											x	x	x		x	x	x		x	
R. aureum	Golden Currant			x	x	x	x	x													

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
R. glandulosum	Skunkberry															x	x	x		x	x
R. hirtellum	Northern Gooseberry											x				x	x		x		
R. hudsonianum	Northern Black Currant					x				x		x		x		x	x	x		x	x
R. inerme	Mountain Gooseberry	x		x																	
R. lacustre	Swamp Gooseberry	x	x			x			x					x		x	x				x
R. oxyacanthoides	Northern Gooseberry	x		x		x		x	x	x	x	x	x	x		x	x	x	x	x	x
R. triste	Swamp Red Currant			x								x		x	x	x	x	x	x	x	x
R. viscosissimum	Sticky Currant	x																			
ROSACEAE (Rose Family)																					
Amelanchier alnifolia	Saskatoon	x	x	x	x	x		x	x	x		x	x	x		x	x	x	x	x	x
Chamaerhodos erecta	Chamaerhodos			x					x	x											
Crataegus rotundifolia	Round-leaved Hawthorn			x		x		x						x		x					
Dryas drummondii	Yellow Mountain-avens	x	x						x	x											
D. octopetala	White Mountain-avens								x	x											
Fragaria vesca	American Wild Strawberry															x				x	x
F. virginiana	Smooth Wild Strawberry	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x
Geum aleppicum	Yellow Avens	x																			
G. macrophyllum	Large-leaved Yellow Avens											x									
G. rivale	Purple Avens								x			x				x		x			
G. triflorum	Three-flowered Avens	x		x	x	x	x	x	x	x	x	x	x	x					x		
Potentilla anserina	Silverweed	x		x	x	x	x	x	x	x	x		x	x		x				x	
P. concinna	Early Cinquefoil	x	x	x	x	x		x	x	x	x		x						x		
P. fruticosa	Shrubby Cinquefoil	x		x		x		x	x	x											
P. gracilis	Graceful Cinquefoil	x				x		x		x											
P. hippiana	Woolly Cinquefoil	x																			
P. nivea	Snow Cinquefoil		x																		
P. norvegica	Rough Cinquefoil	x							x	x							x	x			
P. pensylvanica	Prairie Cinquefoil				x																
Prunus pensylvanica	Pin Cherry					x			x	x		x		x	x	x	x	x	x	x	x
P. virginiana	Black-fruited Choke Cherry	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Rosa sp.	Wild Rose							x										x	x		
R. acicularis	Prickly Rose	x		x	x?				x			x			x	x	x			x	x
R. arkansana	Prairie Rose	x		x	x		x														
R. woodsii	Wood's Rose				x		x				x										
Rubus arcticus	Stemless Raspberry								x	x		x			x	x	x	x	x	x	x
R. chamaemorus	Cloudberry																x			x	x
R. idaeus	Wild Red Raspberry			x						x			x		x	x					x
R. parviflorus	Thimbleberry	x																			
R. pubescens	Dewberry					x			x	x		x		x	x	x	x	x	x	x	x
Sorbus scopulina	Western Mountain Ash																		x		
LEGUMINOSAE (Pea Family)																					
Astragalus aboriginum	Indian Milk Vetch	x	x	x		x			x	x											
A. alpinus	Alpine Milk Vetch			x						x											
A. bisulcatus	Two-grooved Milk Vetch			x	x		x	x			x										
A. crassicarpus	Ground Plum			x				x		x			x								
A. dasyglottis	Purple Milk Vetch	x		x		x	x	x	x		x	x	x	x		x			x		
A. drummondii	Drummond's Milk Vetch			x	x	x					x		x								
A. eucosmus	Milk Vetch								x												
A. flexuosus	Slender Milk Vetch			x																	
A. gilviflorus	Cushion Milk Vetch			x	x	x	x														
A. miser	Timber Milk Vetch									x											
A. missouriensis	Missouri Milk Vetch				x		x						x								
A. pectinatus	Narrow-leaved Milk Vetch			x	x	x	x				x	x									
A. robbinsii	Robbins' Milk Vetch		x	x						x											
A. spatulatus	Tufted Milk Vetch				x																
A. striatus	Ascending Purple Milk Vetch							x	x												
A. tenellus	Loose-flowered Milk Vetch	x					x														
A. vexilliflexus	Few-flowered Milk Vetch	x	x	x					x	x											
Caragana arborescens	Common Caragana	x		x	x		x	x	x			x				x	x	x	x	x	
Glycyrrhiza lepidota	Wild Licorice						x														
Hedysarum alpinum	Alpine Hedysarum							x			x										
H. boreale	Northern Sweet Vetch	x		x	x	x		x	x	x									x		
H. sulphurescens	Yellow Sweet Vetch	x		x					x												
Lathyrus ochroleucus	Cream-colored Vetchling	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lupinus argenteus	Silvery Lupine	x		x	x	x															
L. lepidus	Alpine Lupine			x			x														
L. pusillus	Annual Lupine						x														
L. sericeus	Flexile Lupine	x	x	x																	
Medicago lupulina	Black Medick	x		x	x	x		x	x	x											
M. sativa	Alfalfa				x											x					
Melilotus alba	White Sweet Clover				x																
M. officinalis	Yellow Sweet Clover						x														
Onobrychis viciifolia	Sainfoin															x					
Oxytropis lagopus	Hare-footed Locoweed			x																	
O. monticola	Late Yellow Locoweed						x?		x?												
O. podocarpa	Inflated Oxytrope								x												
O. sericea	Early Yellow Locoweed	x	x	x	x	x	x	x	x	x	x		x	x					x		
O. splendens	Showy Locoweed	x		x					x												
O. viscida	Viscid Locoweed			x				x	x	x											
Petalostemon purpureum	Purple Prairie Clover						x														
Psoralea lanceolata	Scurf Pea						x														
Thermopsis rhombifolia	Golden-bean	x		x	x	x	x	x	x	x	x	x	x	x		x					
Trifolium hybridum	Alsike Clover			x												x					
T. pratense	Red Clover		x			x			x												
T. repens	White Clover	x		x	x	x			x	x		x						x		x	
Vicia americana	American Vetch	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
V. cracca	Tufted Vetch				x																
GERANIACEAE (Geranium Family)																					
Erodium cicutarium	Stork's-bill			x																	
Geranium bicknellii	Bicknell's Geranium											x					x	x		x	
G. richardsonii	Wild White Geranium	x							x												

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
G. viscosissimum	Sticky Purple Geranium	x		x		x		x	x			x									
LINACEAE (Flax Family)																					
Linum lewisii	Lewis' Wild Flax	x		x	x		x	x	x	x	x	x				x					
L. rigidum	Yellow Flax			x	x		x														
POLYGALACEAE (Milkwort Family)																					
Polygala paucifolia	Fringed Milkwort																			x	
P. senega	Seneca Snakeroot											x									
EUPHORBIACEAE (Spurge Family)																					
Euphorbia esula	Leafy Spurge			x	x		x	x								x					
ANACARDIACEAE (Sumac Family)																					
Rhus trilobata	Skunk-bush			x																	
ACERACEAE (Maple Family)																					
Acer glabrum	Mountain Maple	x																			
RHAMNACEAE (Buckthorn Family)																					
Rhamnus alnifolia	Alder-leaved Buckthorn																			x	
MALVACEAE (Mallow Family)																					
Sphaeralcea coccinea	Scarlet Mallow				x		x														
VIOLACEAE (Violet Family)																					
Viola adunca	Early Blue Violet	x	x	x		x		x	x	x	x	x	x	x		x	x	x	x	x	x
V. canadensis	Western Canada Violet	x	x	x		x		x	x	x		x	x	x	x	x	x	x	x	x	x
V. glabella	Yellow Wood Violet	x	x																		
V. nephrophylla	Bog Violet			x		x			x	x		x	x	x		x	x	x		x	x
V. nuttallii	Nuttall's Yellow Violet			x	x	x		x			x										
V. orbiculata	Round-leaved Wood Violet	x																			
V. palustris	Marsh Violet															x	x				
V. pedatifida	Crowfoot Violet										x	x									
V. renifolia	Kidney-leaved Violet								x	x						x		x		x	
CACTACEAE (Cactus Family)																					
Coryphantha vivipara	Cushion Cactus				x		x														
ELAEAGNACEAE (Oleaster Family)																					
Elaeagnus commutata	Wolf Willow	x		x	x	x	x	x	x	x	x	x	x			x			x	x	
Shepherdia canadensis	Canada Buffaloberry		x						x	x									x	x	
ONAGRACEAE (Evening Primrose Family)																					
Gaura coccinea	Scarlet Butterflyweed				x		x														
Oenothera caespitosa	Butte Primrose			x	x		x														
HIPPURIDACEAE (Mare's-tail Family)																					
Hippuris vulgaris	Mare's-tail								x					x		x					
ARALIACEAE (Ginseng Family)																					
Aralia nudicaulis	Wild Sarsaparilla					x			x			x	x	x	x	x	x	x	x	x	
UMBELLIFERAE (Carrot Family)																					
Angelica dawsonii	Yellow Angelica	x	x																		
Carum carvi	Caraway																	x			
Cymopterus acaulis	Plains Cymopterus						x														
Heracleum lanatum	Cow Parsnip	x		x								x									
Lomatium cous	Biscuit-root					x?															
L. dissectum	Mountain Wild Parsnip	x		x																	
L. foeniculaceum	Hairy-fruited Parsley			x	x		x												x		
L. macrocarpum	Long-fruited Parsley	x	x	x	x	x															
L. triternatum	Western Wild Parsley	x	x	x																	
Musineon divaricatum	Leafy Musineon			x	x	x		x													
Osmorhiza chilensis	Blunt-fruited Sweet Cicely	x				x															
O. depauperata	Spreading Sweet Cicely								x						x		x				
O. occidentalis	Western Sweet Cicely	x																			
Zizia aptera	Heart-leaved Alexanders	x		x		x		x	x	x	x	x		x		x	x		x		
CORNACEAE (Dogwood Family)																					
Cornus canadensis	Bunchberry											x			x	x			x	x	x
C. stolonifera	Red-osier Dogwood	x		x	x		x	x	x	x	x	x		x	x	x	x	x	x	x	x
PYROLACEAE (Wintergreen Family)																					
Pyrola asarifolia	Common Pink Wintergreen								x										x		x
ERICACEAE (Heath Family)																					
Andromeda polifolia	Bog Rosemary															x				x	
Arctostaphylos rubra	Alpine Bearberry								x	x										x	
A. uva-ursi	Common Bearberry	x	x	x		x		x	x	x		x		x		x	x	x	x	x	x
Chamaedaphne calyculata	Leatherleaf																			x	x
Kalmia polifolia	Pale Laurel																			x	
Ledum groenlandicum	Common Labrador Tea									x		x			x	x	x	x	x	x	x
Menziesia ferruginea	False Azalea	x																			
Oxycoccus microcarpus	Small Bog Cranberry																			x	x
Vaccinium caespitosum	Low Bilberry									x											
V. membranaceum	Tall Bilberry	x										x?									
V. myrtilloides	Blueberry											x				x	x	x		x	x
V. vitis-idaea	Bog Cranberry											x				x	x	x		x	x
PRIMULACEAE (Primrose Family)																					
Androsace chamaejasme	Pygmy Shieldwort								x	x											
A. septentrionalis	Pygmyflower	x		x	x	x			x	x	x	x	x	x		x	x	x	x	x	
Dodecatheon conjugens	Mountain Shootingstar	x	x	x		x			x	x											

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
D. pulchellum	Saline Shootingstar	x		x				x	x	x	x	x	x	x		x	x			x	
Glaux maritima	Sea Milkwort			x									x								
Primula incana	Mealy Primrose												x	x						x	
P. mistassinica	Dwarf Primrose								x	x											
Trientalis borealis	Northern Starflower																x	x		x	x
GENTIANACEAE (Gentian Family)																					
Gentiana aquatica	Marsh Gentian											x									
MENYANTHACEAE (Buck-bean Family)																					
Menyanthes trifoliata	Buck-bean								x					x	x	x					
APOCYNACEAE (Dogbane Family)																					
Apocynum cannabinum	Indian Hemp						x														
POLEMONIACEAE (Phlox Family)																					
Collomia linearis	Narrow-leaved Collomia			x																	
Phlox alyssifolia	Blue Phlox	x		x																	
P. hoodii	Moss Phlox			x	x	x	x				x										
Polemonium pulcherrimum	Showy Jacob's-ladder	x	x						x	x											
HYDROPHYLLACEAE (Waterleaf Family)																					
Hydrophyllum capitatum	Woollen-breeches	x																			
Phacelia hastata	Silver-leaved Scorpionweed	x																			
P. sericea	Silky Scorpionweed	x	x						x	x											
BORAGINACEAE (Borage Family)																					
Cryptantha macounii	Macoun's Cryptanthe			x		x	x														
C. nubigena	Clustered Cryptanthe	x			x																
Cynoglossum officinale	Hound's-tongue	x		x	x			x													
Hackelia floribunda	Large-flowered Stickseed			x	x																
H. jessicae	Jessica's Stickseed	x																			
Lappula occidentalis	Western Bluebur			x	x		x			x	x			x							
L. squarrosa	Bluebur	x					x		x												
Lithospermum incisum	Narrow-leaved Puccoon		x	x	x		x	x		x	x			x							
L. ruderale	Woolly Gromwell	x		x		x		x	x	x											
Mertensia paniculata	Tall Lungwort								x			x			x	x	x	x	x	x	x
Myosotis alpestris	Alpine Forget-me-not		x							x											
Plagiobothrys scouleri	Scouler's Allocarya			x																	
LABIATAE (Mint Family)																					
Glecoma hederacea	Ground-ivy																x			x	
Lamium amplexicaule	Henbit			x																	
SOLANACEAE (Nightshade Family)																					
Hyoscyamus niger	Black Henbane							x				x				x					
SCROPHULARIACEAE (Figwort Family)																					
Besseya wyominensis	Kitten-tails					x?															
Castilleja cusickii	Yellow Paintbrush			x																	
C. hispida	Hispid Paintbrush	x	x																		
C. lutescens	Stiff Yellow Paintbrush	x		x																	
C. miniata	Red Indian Paintbrush								x	x		x							x		x
C. raupii	Purple Paintbrush																				x
Collinsia parviflora	Blue-eyed Mary	x		x		x				x											
Linaria dalmatica	Broad-leaved Toadflax			x																	
L. vulgaris	Butter-and-eggs						x		x							x					
Pedicularis groenlandica	Elephant's-head								x												
Penstemon albertinus	Blue Beardtongue	x																			
P. albidus	White Beardtongue				x		x														
P. confertus	Yellow Beardtongue	x		x																	
P. gracilis	Lilac-flowered Beardtongue						x														
P. lyallii	Large-flowered Beardtongue	x																			
P. nitidus	Smooth Blue Beardtongue	x		x	x	x	x	x	x												
P. procerus	Slender Blue Beardtongue	x		x	x	x					x		x						x		
Veronica americana	American Brooklime			x																	
V. peregrina	Hairy Speedwell			x																	
V. serpyllifolia	Thyme-leaved Speedwell	x																			
OROBANCHACEAE (Broom-rape Family)																					
Orobanche uniflora	One-flowered Cancer-root	x																			
LENTIBULARIACEAE (Bladderwort Family)																					
Pinguicula vulgaris	Common Butterwort								x	x							x				
PLANTAGINACEAE (Plantain Family)																					
Plantago canescens	Western Ribgrass			x																	
P. elongata	Linera-leaved Plantain															x					
P. major	Common Plantain	x																			
RUBIACEAE (Madder Family)																					
Galium boreale	Northern Bedstraw									x		x									x
G. labradoricum	Labrador Bedstraw																				x
CAPRIFOLIACEAE (Honeysuckle Family)																					
Linnaea borealis	Twinflower																		x		
Lonicera caerulea	Blue Fly Honeysuckle																	x		x	
L. dioica	Twining Honeysuckle							x	x			x			x	x			x		x
L. involucrata	Bracted Honeysuckle	x	x						x	x		x			x	x	x	x	x	x	
L. tartarica	Tartarian Honeysuckle			x	x		x	x								x					
L. utahensis	Utah Honeysuckle	x	x																		
Sambucus racemosa	Elderberry	x		x				x								x					
Symphoricarpos occidentalis	Buckbrush				x													x?			
Viburnum edule	Low-bush Cranberry					x			x	x		x		x	x	x	x	x	x	x	x

FAMILY SCIENTIFIC NAME	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
V. opulus	High-bush Cranberry														x	x			x		
ADOXACEAE (Moschatel Family)																					
Adoxa moschatellina	Moschatel								x							x	x			x	
VALERIANACEAE (Valerian Family)																					
Valeriana dioica	Northern Valerian	x							x	x		x				x	x			x	
V. sitchensis	Mountain Heliotrope	x																			
CAMPANULACEAE (Bluebell Family)																					
Campanula rotundifolia	Harebell								x										x		
COMPOSITAE (Composite Family)																					
Achillea millefolium	Common Yarrow	x		x	x	x	x	x	x		x	x	x						x		
Agoseris glauca	False Dandelion	x							x		x		x								
Anaphalis margaritacea	Pearly Everlasting	x		x																	
Antennaria anaphaloides	Tall Everlasting	x		x		x															
A. aprica	Low Pussytoes	x		x	x	x	x		x			x				x			x		
A. neglecta	Broad-leaved Pussytoes	x				x		x	x	x	x		x			x	x	x			
A. parvifolia	Small-leaved Everlasting	x		x	x	x		x	x	x	x		x	x		x	x			x	
A. pulcherrima	Showy Everlasting								x												
A. racemosa	Racemose Everlasting	x																			
A. rosea	Rosy Everlasting	x	x	x	x	x		x	x	x											
A. umbrinella	Brown-bracted Mountain Everlasting			x																	
Arnica cordifolia	Heart-leaved Arnica	x	x			x			x			x							x		
A. fulgens	Shining Arnica			x				x			x								x		
A. lonchophylla	Spear-leaved Arnica								x												
Balsamorhiza sagittata	Balsamroot	x	x	x																	
Cirsium hookerianum	White Thistle		x?																		
Crepis tectorum	Annual Hawksbeard						x		x	x						x	x		x		
Erigeron caespitosus	Tufted Fleabane			x	x		x												x?		
E. compositus	Compound Fleabane	x	x	x					x	x											
E. glabellus	Smooth Fleabane			x							x		x						x		
E. philadelphicus	Philadelphia Fleabane															x					x
E. radicatus	Dwarf Fleabane			x					x?												
Gaillardia aristata	Brown-eyed Susan	x			x																
Heterotheca villosa	Golden Aster	x			x		x		x												
Hymenopappus filifolius	Tufted Hymenopappus			x																	
Hymenoxys acaulis	Stemless Rubberweed			x	x																
H. richardsonii	Colorado Rubberweed			x	x		x														
Iva axillaris	Povertyweed			x																	
Matricaria matricarioides	Pineappleweed			x	x											x				x	
M. perforata	Scentless Chamomile															x			x		
Petasites palmatus	Palmate-leaved Coltsfoot								x	x										x	x
P. sagittatus	Arrow-leaved Coltsfoot								x			x				x	x			x	
P. vitifolius	Vine-leaved Coltsfoot								x												x
Senecio canus	Silvery Groundsel	x		x	x	x		x	x	x											
S. congestus	Marsh Ragwort										x		x	x		x	x	x	x		x
S. integerrimus	Entire-leaved Groundsel	x		x		x			x												
S. pauperculus	Balsam Groundsel										x										
S. streptanthifolius	Northern Ragwort																		x		
S. vulgaris	Common Groundsel						x												x		
Taraxacum officinale	Common Dandelion	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Townsendia hookeri	Hooker's Townsendia		x?		x?																
T. parryi	Parry's Townsendia	x		x																	
Tragopogon dubius	Yellow Goat's-beard	x		x	x		x									x					

Total Number of Species: 485

1	Waterton Lakes National Park (173)
2	Mt. Gladstone/Mill Creek (66)
3	Whiskey Gap (203)
4	Lethbridge and area (98)
5	Cypress Hills Provincial Park (110)
6	Medicine Hat (68)
7	Calgary and area (91)
8	Yamnuska/Bow Corridor (167)
9	Banff/Canmore/Wind Ridge (129)
10	Rumsey Aspen Parkland (69)
11	Red Deer and area/Burnstick Lake (79)
12	Buffalo Lake (53)
13	Wainwright Dunes Ecological Reserve (74)
14	Coyote Lake (40)
15	Edmonton and area (152)
16	Entwistle/Glenevis/Campbell Springs (100)
17	Lac La Biche/Athabasca/Hanmore Lake (68)
18	Grande Prairie and area (75)
19	Fort McMurray (92)
20	High Level and area (75)

What Was That? - Interesting Bird Sightings in Alberta

Since the completion of the Alberta Bird Atlas Project, FAN is still receiving calls and letters from across the province in regards to interesting and unusual bird sightings. These have been accumulating in the office over the past several months and we thought they should be shared. This interest is certainly not new, as Tom Maccagno of Lac la Biche sent us a copy of an article from the August 2, 1916 issue of the Edmonton Bulletin, reporting nesting pelicans on Lac la Biche.

On May 20, 1993, Gorden Ashacker was birding near the Richardson Fire Tower in the north east corner of the province, when he observed about 30 Horned Larks. He reports that they stayed in the area feeding near an airstrip until May 28.

Randy Nystrom of Lethbridge has recorded a provincial first sighting. On June 17, 1993 he observed a Green-tailed Towhee at his bird feeder. Other birders were called to confirm the observation.

In August of 1993, Bruce Taylor of Hardisty sent in a list of "uncommon" birds in his area. This included several sightings of Great Crested Flycatcher, a pair of Bobolinks, a Western Tanager, and a pair of Northern Goshawks which nested in the area for three consecutive years.

Christmas Bird Counts in 1993 resulted in some unusual sightings including the Great Blue Heron in Edmonton. The Lethbridge count recorded the Short-eared Owl, Northern Harrier, Swainson's Hawk and Cooper's Hawk. In the Waterton Lakes count a Killdeer was recorded. Claresholm added many "new" species: Golden-crowned Kinglet, Cedar Waxwing, Red Crossbill, Yellow-rumped Warbler and Brambling. Fort McMurray reported Purple Martin, Rusty Blackbird and Brewer's Blackbird. Snow Bunting and Snowy Owl were reported wintering in the Cypress Hills. Calgary recorded a Pine Warbler, a female Northern Cardinal and a Pacific Loon.

Canmore had its share of unusual sightings starting with the Sandhill Crane that visited for a few days in the fall. During the Christmas count a Peregrine Falcon was recorded and on Family Day, Bruce Bembridge sighted a Stellar's Jay and a Pine Grosbeak.

The Wild Bird General Store Bird Hotline reports a number of Northern Saw-whet Owls in the Edmonton area in late February. Also reported were a Northern Cardinal in Edmonton and a gay phase Gyrfalcon at Lake Wabamun.

Ann Owens reports a pair of Pileated Woodpeckers feeding in her yard near Devon over the winter of 93-94.

On March 3, 1994 the first Golden Eagles were sighted returning to Kananaskis.

A Mountain Bluebird was sighted by Alma Bohoslawec along the Winterburn Road South near Edmonton on March 6, 1994.

Harold Pinel, Wayne Smith and Cleve Wershler have completed Vol. 2 (Passerines) of their Alberta Birds 1971-1980 series. Both volumes are available from the Provincial Museum in Edmonton or send $15.50 to the Calgary Field Naturalists Society, c/o 1017 - 19 Avenue N.W., Calgary T2M 0Z8

If you have any unusual bird sightings please write to the Alberta Naturalist.

Errata for "C. Macdonald, W.E. Roberts and D.M. Ealey. The vertebrate species of Alberta. Alberta Naturalist 23(3):Supplement (pages I and II, and 1-16.)"

Page I: change *"Thamnopis"* to *"Thamnophis"* in third paragraph in left-hand column.

Page I: change "St. Mary's" to "the St. Mary River" in the third paragraph of the right-hand column.

Page II: add the following reference: Honacki, J.H., K.E. Kinman and J.W. Koeppl. (eds.). 1982. Mammal species of the world. A taxonomic and geographic reference. Allen Press and Association of Systematics Collections, Lawrence, Kansas. 694 pp.

Page 2: change *"artedii"* to *"artedi"* as species' epithet for the cisco.

Page 2: change "&" to "and" for the two authorities where the ampersand is used.

Page 2: change "Mitchell" to "Mitchill" as the authority for *Salvelinus fontinalis,* the brook trout.

Page 3: under SCULPINS change "St. Mary's" to "St. Mary River" for *Cottus* sp.

Page 3: change "&" to "and" for mosquitofish authority where this ampersand is used.

Page 3: both uses of "sp." for unknown species' epithets should not be in italics.

Page 4: for eastern short-horned lizard change *"douglasii"* to *"douglassi" for correct spelling.*

Page 4: under the suborder SERPENTES -- SNAKES, the line for the family COLUBRIDAE -- TYPICAL HARMLESS SNAKES should precede XENODONTINAE -- NEOTROPICAL SNAKES.

Page 4: change the word "FAMILY" to "SUBFAMILY" for the following: XENODONTINAE, and NATRICINAE.

Page 13: under BIRD SPECIES OF HYPOTHETICAL STATUS the scientific name for emperor goose should be *"Anser canagicus* (Sevastianov)".

Page 15: for Canada lynx, change the authority for the scientific name from "Kner" to "Kerr".

Supplement Number 8 **Alberta Naturalist Volume 24, Number 2**

Alberta Christmas Bird Counts 1993

Addendum to the 1993 May Species Count - Plants in Flower

Alberta Bird Checklist Program

Alberta Christmas Bird Counts, 1993

Andrew Slater

The Pine Warbler is a rare vagrant from the East that has only been recorded in the Calgary region three times since 1975, all in August or September. Imagine the amazement of Calgary birders when a warbler that was found during the Christmas count in an area of mature ornamental spruce trees turned out to be this species! The bird remained in the area into February, and was scrutinized and identified by many of the local birding community. It could usually be found fairly easily on sunny days as it "chipped" loudly while apparently feeding on grubs, in company with Red-breasted Nuthatches, Golden-crowned Kinglets and a Brown Creeper.

Calgary's other new bird for any Alberta CBC was somewhat less surprising, but still unexpected. A Pacific Loon in almost full breeding plumage had taken up residence on a stretch of the Bow River near the downtown several weeks before. After Christmas, this stretch gradually froze over and, as the loon seemed weak, a rescue was attempted. Unfortunately, it was unsuccessful, and the bird disappeared in mid-January.

These two new additions brought the all-time number of species reported on CBC's in Alberta to 160. The total for this year was 112, which equals that of 1991 as the second highest ever. The number of counts was 57, 10 less than last year but 4 more than the highest before that. The drop was caused by compilers/organizers being sick, going on vacation or leaving the province, and by my not yet having established proper communications with the counts in the High Level area.

Generally mild weather before and during the count period resulted in several half-hardy species lingering in unusually high numbers, while good nesting conditions last summer produced many more young of some residents and winter visitors.

In particular, this was the year of the Redpoll. Flocks of these tiny winter visitors from the Arctic were an often-remarked feature of counts all over the province. The totals of 16031 Commons and 475 Hoaries compared to previous highs of 10388 and 236 respectively, both in 1991. Last year the combined total was just over three thousand, which was the lowest since 1987.

A drastic fall in the lemming population in the north was presumably responsible for the abnormally high number of Snowy Owls in Alberta this winter. 124 were counted in all, more than twice the previous high, 52 in 1991. There has not been a poor Snowy Owl year since 1988; if the lemmings have crashed, it will be interesting to see what happens to the owls next year!

Four counts found Long-eared Owls; in none of the three years that this species has occurred before has there been more than one. Another species way up was Common Goldeneye, with 4221 as compared to 2095 in 1988 and rather below two thousand for following years. The number in Calgary alone well exceeded any previous provincial total.

Other species with highest-ever Provincial totals were: Snow Goose, Barrow's Goldeneye, Common Merganser, Bald Eagle, Rough-legged Hawk, Saw-whet Owl, Northern Flicker, Pileated Woodpecker, Gray Jay, American Crow, Common Raven, Mountain and Boreal Chickadees, Red-breasted Nuthatch, American Dipper, American Robin, Cedar Waxwing, European Starling, Yellow-rumped Warbler, Song Sparrow, Brewer's Blackbird, Common Grackle and Evening Grosbeak. The last was yet again mainly confined to the northern and central parts of the province.

Although not establishing new highs, Snow Buntings were plentiful again; Brown Creepers and Pine Siskins almost doubled last year's totals; Golden-crowned Kinglets quadrupled last year's total; and White-winged Crossbills jumped back up from 34 to 2126. Ruffed Grouse numbers improved a little from last year but Sharptails were down. Great Gray Owls had a normal ,good year after the major invasion of 1992. Steller's Jays and Gray-crowned Rosy Finches evidently found little cause to leave their summer territories. For some reason, Three-toed Woodpeckers were very had to find, only 29 being counted against 81 last year.

The Bow Corridor count changed its name for its second year to Bow-Kan as the Kananaskis River, as well as the Bow, flows through the circle. A pair of small ducks, seen briefly before taking flight, appeared to be Cinnamon Teal, which have not been recorded on an Alberta CBC before. Unfortunately, this identification could not be confirmed. More sure were 66 American Dippers, a North American all-time high. 64 of them were on the Kananaskis River between Mount Lorette and Barrier Lakes, a stretch which was not surveyed last year. Rumour has it that an eminent and enthusiastic Calgary birder, well known for his research at Mount Lorette, fell into the Kananaskis while ensuring that no Dipper was missed!

Three Purple Finches were new to the Calgary count, and a Black Duck (the fourth provincial CBC record) and a House Finch were noteworthy. Also noteworthy was a total absence of Pine Grosbeaks, only the third time this has occurred in 42 years. Presumably there is a good wild food crop in the north to sustain these inhabitants of the taiga so that they need not come south. A female Northern Cardinal, that had been seen intermittently for some weeks before the count on a wooded island in the Bow River, could not be found on count day, though it re-appeared shortly afterward. If it had been more cooperative, this bird would have provided a record of a cardinal on an Alberta CBC for the third straight year.

Cardston added five new species, including the only

Lapland Longspurs in the Province this year, and pushed its all-time high from 21 species to 29. Coyote Lake also reported a great count, with four owl species, a Black-backed Woodpecker and a Rusty Blackbird.

Claresholm almost merits an article of its own! A Brambling, a vagrant from Eurasia, and two Yellow-rumped Warblers came to the same feeder and were still visiting in late January, by which time 66 people had come to see them. A Brambling was visiting a feeder in Edson during the 1989 count, while single Yellow-rumps were on the Calgary count in 1991 and 1992. An explosion in the mouse/vole population in this region resulted in numbers of raptors almost unimaginable at Christmas in other parts of the province. These included 5 Northern Harriers, 9 Golden Eagles, 73 Rough-legged Hawks, 5 Prairie Falcons and 11 Short-eared Owls! A flock of Wild Turkeys from the Porcupine Hills population was found for the second successive year.

It was pleasing to receive a report from the Cypress Hills, but contrary to my assertion last year that a count there would produce Wild Turkeys, it didn't! However, a Snowy Owl was new to the count and 5095 Snow Buntings was an all-time provincial high.

Edmonton added Great Blue Heron and Long-eared Owl to its all-time list. The heron was the one hundredth species recorded on the count since its inception, which was as far back as 1906. Numbers of Snowy Owls, Saw-whet Owls and Cedar Waxwings were impressive, but Bohemian Waxwings were had to find, only 374 as opposed to 11330 last year!

Avid counters in Calgary have been frustrated for years because the prime birding habitat of Fish Creek Provincial Park lies along, but just outside, the southern edge of their count circle, and can never be included in an "American Birds" fifteen mile-diameter count without moving the Calgary circle first. This year, a group supported by the Fish Creek Environmental Support Society held a count within the park boundary anyway. The fertile waters of the Bow River provided high numbers of waterfowl, especially Canada Geese and Common Goldeneyes, while smaller numbers of mixed-forest species were found. Their Gyrfalcon was of the rare white phase.

Eighteen Dark-eyed Juncos were surprising as far north as Fort McMurray, together with both Brewer's and Rusty Blackbirds. Southern counters will note that there was no shortage of grosbeaks up there, nearer their breeding areas.

The prairie coulees of the Horseshoe Canyon count, near Drumheller, again produced high numbers of coniferous forest birds, including 181 Red-breasted Nuthatches, 94 Golden-crowned Kinglets and 9 American Robins. Contrary to the situation in the south, Lac La Biche found raptors very scarce due to a shortage of voles, mice and hares. The wonderful old-growth conifers of Sir Winston Churchill Provincial Park produced only one Black-backed Woodpecker this year and no Three-toeds. However, all the news was not bad: eight new species were added at Lac La Biche, with Merlin and Dark-eyed Junco being the highlights.

Lethbridge did not come up with quite the sensational results of some years, but added Gadwall, Cooper's Hawk and Red Crossbill. Six Song Sparrows was an unusually high number, while their three Snow Geese represented the third provincial CBC record. Medicine Hat had one in 1986 and Wabamun Lake one in 1989. This year, Medicine Hat also added three species: Clark's Nutcracker, Red-winged Blackbird and Western Meadowlark. Two Harris' Sparrows were noteworthy as well.

Ponoka reported that, while only one Cedar Waxwing was counted on "The Day", a flock of thirty plus was around in mid-January. The compiler also observed that House Sparrows were down in that area. Cedar Waxwings outnumbered Bohemians in parts of Central Alberta, an unprecedented situation as far as I know. Red Deer found 82 Cedars against 35 Bohemians, while the corresponding numbers at Sylvan Lake were 63 and 20.

St. Albert found four new species and also reported a Chukar Partridge. Unfortunately, this bird is no longer on the Alberta list as none of the introductions to date have been successful. This individual will therefore have to remain an "uncountable escape". (A pity, as it could otherwise have been provincial new species number four!)

Wabamun Lake included a party in a canoe this year, who succesfully penetrated the fog that often shrouds their extensive areas of open water. Two swans that were originally identified as Tundras were subsequently thought more likely to be Trumpeters; a Double-crested Cormorant was the third record for the count (and the fourth for the province), while a Horned Grebe was the first for several years. On land, a Long-eared Owl responded to taped calls in the middle of the night and later a Barred Owl flew in to an observer who was "pishing" for Chickadees, giving good views from 25 metres. A Belted Kingfisher was also new for the count.

High winds at Waterton Lakes largely counteracted high participation as far as bird numbers went, but a Killdeer, a Common Merganser and a Spruce Grouse were all notable. 35 Horned Larks at Wembley was exceptional so far north.

Two counts reported Swainson's Hawks, without any details. Because this long-distance migrant hardly ever winters in North America outside Florida, let alone in Alberta, and is easily confused with other raptors, I am going to treat it in the same way as Loggerhead Shrike. A convincing description is needed for these species to be accepted.

My thanks go again to Teresa Dolman and Myrna Pearman for co-ordinating the counts in the Lethbridge and Red Deer regions respectively, and to all the count compilers, especially those who sent stories and comments to flesh out the statistics.

Count Dates, Compilers and Participants

Banff/Canmore: Dec. 18. Compiler: Mike McIvor, Box 114, Banff, AB T0L 0C0. Participants: James Bannon, Theresa Bannon, Heather Dempsey, Morag Dornian, Peter Duck, Kevin Elliot, Keith Everts, Halle Flygare, Linda Flygare, Don Gorrie, Jean Greig, Paul Greig, Joel Hagen, Mary Harding, Carole Harmon, Dolores Holub, Deb Hornsby, Sebastian Hutchings, Doug Leighton, Myriam Leighton, Diane McIvor, Mike McIvor, Carol Mehling, Mike Potter, Janet Rodgers, Jason Rogers, Claudia Rustenberg, Michael Shuster, Shelley Shuster, Bob Smith, Cyndi Smith, Don Waters, Keith Webb, Cliff White, Lorriane Widmer-Carson, Gerry Wilkie, Beth Woolley, David Yaki, Gus Yaki, Eva Zidek.

Beaverlodge: Dec 18. Compiler: Joan E. Kerr, Box 516, Beaverlodge, AB T0H 0C0. Participants: Jim Brown, Maxine Brown, Terri Brown, Carol Cassity, Marie Cliffe, Kozy Ellingboe, Jerry Kerr, Joan Kerr, Kelly Kerr, Kelsey Kerr, Wayne McLauchlan, Roy Mulligan, Vince Salvo, Jeanne Smith, Joan Snyder Maureen Sywolos.

Berwyn: Dec. 29. Compiler: Jessie Kinley, Box 327, Berwyn, AB T0H 0E0. Participants: Rodney Crumb, Irene Crumb, Birget Sorensen, Elvira Sorensen, Morley Messner, Linda Messner, Paul Messner, Amy Messner, Lena Williamson, Tom Dixon, Mary Dixon, Roy Cardy, Gladys Cardy, Joyce Meyers, Kathleen Meyers, Grace Lilienskold, Berry Murphy, Diana Rinne, Jessie Kinley.

Bow Kan: Jan. 2. Janet E. Rodgers, Box 153, Exshaw, AB T0L 2C0. Participants: Des and Nicholas Allen, Heather Ashley, Kevin Barker, Barbara Belyea, Chantale Benoit, Bob and Ruth Camenzind, Sue Cameron, Allison Casey, Dene and Jean Cooper, Gloria and Stan Cowley, Linda and Tim Davis, Pat Donald, Bert and Marilyn Dyck, Dennis and Eileen Freels, Joanne Gee, Marc Heroux, June Jacobs, Wayne Kenefick, Debbie Hall, Donna MacKay, Dick and Miki Mann, Mrs. Maloff, Stella McIntyre, Meg Nicks, Bente Preshaw, Gail Rae, Rosie Reid, Ailene and Box Reynolds, Janet Rodgers, Paula Rodriguez, Diane, Wayne, Chelcy and Mandy Scott, Barbara and Peter Sherrington, Lee Sproule, Helmut and Jean Vollmer, Karen Yamazaki, Eva Zidek.

Bow Summit: Jan. 1. Compiler: Mike McIvor, Box 114, Banff, AB T0L 0C0. Participants: Diane McIvor, Mike McIvor.

Buffalo Lake: Dec. 26. Compilers: Lloy Lohr, Box 1414, Stettler, AB T0C 2L0 and Carol Simpson, #20 Emmerson Acres, Stettler, AB T0C 2L0. Participants: Doreen Anderson, Lex Bickle, Ann, Art, Charlie, Dixie, Heather, and Philip Bird, Roger Burmeister, Don Carlyle, Osborne Clark, Thelma Dobson, Carol, John Laurie, and Sherry Fletcher, Marj Flewelling, Lavina Larson, Lloyd Lohr, Evelyn O'Hara, Bess Patterson, Jack Ritchie, Don Roucroft, Carol Simpson, Garnet Stark, Marlene Walentowitz, Don and Dorothy Wilson.

Calgary: Dec. 19. Compiler: Ian R. Halladay, 2103 Crocus Road N.W., Calgary, AB T2L 0Z7. Participants: Daryl Addision, Des Allen, Liz Allen, Winnie Amos, Ella Arnold, Lorne Arnold, Shirley Ausmus, Mairie Babey, Toy Baker, John Bargman, Sandra Barker, Anna-Marie Beckmann, Tom Bishop, Margaret Brown, Darby Buckley Jones, Bill Campbell, Rod Chisholm, Mary Clitheroe, Nancy Cook, Bob Cooper, Pat Cooper, Rus Costello, Sue Costello, Mary Coughlin, Helen Courterell, Sheila Cox, Ruth Craig, Eileen Dann, Doreen Dixon, Ted Dixon, Morag Dornian, Judith Doyle, Jean Dunn, Rodger Dunn, Gail Edwards, Ingrid Ekvedt, Brian Elder, Joyce Elphinstone, Nora Elphinstone, Sue Fletcher, Dick Flynn, Lenora Flynn, Joyce Frank, Shirley Fraser, Barry Giles, Howard Giles, Florence Godfrey, Joyce Goldsmith, David Gravel, Horst Grothman, Val Haines, Ian Halladay, C.H. Hansen, Art Harris, Harold Harrison, Bud Henning, Joanne Henning, Lorraine Herwig, Shirley Hill, Cedric Hitchon, Robin Hitchon, Norm Holden, Andrew Holder, Bob Hollinshead, Sue Hollinshead, Bill Hooker, Catherine Hooker, Mary Huston, Ella Irwin, Jean Irwin, Richard Irwin, Marieke Jalink, Wim Jalink, Joanne Jamison, Cathy Jarrell, Linda Javeri, Judy Jekill, Marilyn Jermyn, Linda Joehnck, Steve Kassai, Bev Kissinger, Ed Kissinger, Fran Kitchingham, Anita Kohse, Terry Korolyk, Ted Koziel, Dave Langdon, Trygve Larson, Ross Lein, Corinne Lofthouse, Mac Love, Jo Luttmer, Colin MacDonald, Heather MacDonald, Don Magnusson, Carson Manzer, Mary Manzer, Joanne Mark, Bob Marshall, Doris Marshall, Jan Marshall, Len Marshall, Belle Mathie, Dave Matthews, Jean Matthews, Karen McCullough, Greg McDonald, John McFaul, Catherine McGlashan, Greg Meyer, Verne Miller, Molly Milne, Pat Mitchell, Claudette Monette-Brown, Jean Moore, Lorraine Moore, Sherrold Moore, Wayne Moore, Gordon Neill, Margaret Neill, Dorothy Newman, Lynn Newman, Hilda Obermeyer, Ingrid Pagenkopf, Aileen Pelzer, Heidi Plum, Jamie Podlubny, Jim Posey, Kay Power, Mike Power, Mike Preston, John Price, Don Ray, Ian Richards, Mike Rogers, Scott Rogers, Kathy Roman, Alan Rudkin, Jill Sharpe, Peter Sherrington, Gwen Simpson, Andrew Slater, Penny Smith, Ena Spalding, Clarence Spicer, Mynn Steinbach, Vic Steinbach, Don Stiles, Philip Stiles, Bob Storms, Anne Taylor, Bill Taylor, John Thompson, Margaret Thompson, John Totino, Nicholas Totino, Richard Trahan, Bill Trigg, Merlin Trigg, Howard Troughton, Leah Truch, Tina Van Egmong, Weldon Vickers, Bill Walker, Jim Washbrook, Grace Webber, Walter Webber, Alec Weir, Bill Wilson, Gus Yaki, Pat Young, Penny Young, Rick Young.

Coyote Lake: Dec. 27. Compiler: Doris Hopkins, R.R. #1, Warburg, AB T0C 2T0. Participants: Don Aronyk , Virginia Aronyk, Barbara Beck, Jim Beck, Mary Campbell, Margaret Cropley, Neil Durrant, Rosemary Durrant, Ethel Hayes, Anne Hinds, Dories Hopkins, Eric Hopkins, Eleanor Johnson, Frances Losie, Joe Land, Myrna Land, Caroline MacDonald, Arlynn Miller, Carol Petrie, Scotty Petrie, Linda Wall, Tom Wall.

Crestomere: Dec. 19. Participants: Nancy G. Mackenzie, Ruth Mumby, Art and Phyllis Walcheske.

Cypress Hills: Jan. 9. Compiler: Keith Bocking, Cypress Hills, P.P., P.O. Box 12, Elkwater, AB T0J 1C0. Participants: Paul Avery, Troy Bartman, Kelly and Richard Bogle, Judi, and Bill Frank, Simone and Neal Siedlecki, Wilber Tripp, Tom Trott, Ron Tullet, Ben Velner, Angela and Ian Turner, John Dewalt, Garry Newton.

Devon: Dec. 26. Compiler: Ross Hodgetts, Site 15, R.R. 5, Box 49, Edmonton, AB T5P 4B7. Participants Fritz and Barbara Daniels, John Bell, Ross Hodgetts, Ross Dixon, Darrell Frohlick, Jim and Barbara Beck, Lorne and Stephany Proudfoot, Bill and Denise Jopling, Karen Mella, Louis and Wes Hochochka, Korothy Knull, Ethyl Coates, Pat Vaslastin, Steve Cherwonick, Al Lyon.

Dickson Dam: Dec. 19. Compilers: Carol, Grant, Erin and Todd Kelly. Participants: Phillip and Colleen Anderson, Herb and Joan Hansen, John Henderson, Carol, Grant, Erin and Tood Kelly, Christina and Tony Orr, Hope Patko, Stuart Smith, William and Doreen Thomsen.

Drayton Valley: Dec. 21. Compiler: Helmut Amelang, P.O. Box 6791, Drayton Valley, AB T0E 0M0.

Eaglesham: Dec. 17. Compiler: Anne Donaldson. Participants: Anne Donaldson, Emily Sanocki, Gilbert F. Rice, John Morgan.

Eckville: Dec. 19. Participants: Hal and Linda Lutz.

Edmonton: Dec. 19. Compiler: Fred Whiley, 12342 - 91 Street, Edmonton AB T5B 4C5. Participants: Cathy Acheson, Harry Acheson, John Acorn, Rachel Amares, Gary Anderson, Gwen Andre, Gary Anweiler, Dwight Barton, Elisabeth Beaubien, Barbara Beck Jim Beck, Lorne Behme, Ted Belke, Suzanne Benoit, Richard Biel, Josh Bilyk, Barry Birch, Brian Birch, Robin Bovey, Mark Brown, Jean Burgess, Elaine Butler, Jim Butler, Jayne Carlyle, Jean Chapman, John Chapman, Linda Cheney, Jim Christie, Kim Clark, Dawn Colwell, Tara Corcoran, Vince Cottrell, Pat and Dick Clayton, Ray Cromiei, Dave Cuthiell, Maggie Davidson, Dale Dawson, Fred Dawson, Peter Demulder, Dave Dodge, Jason Duxbury, Dave Ealey, Doug Edgar, Joanne Edgar, Edmunds family, Gordon Elbrand, Cam Finlay, Joy Finlay, Warren Finlay, Doris Francis, Barb Gauf, Don Genova, Monique Genova, Paul Goosen, Valerie Goosen, Bernice Grover, Dennis Grover, Allan Hacking, Jim Henry, Mark Hewitt, Alan Hingston, Geoff Holroyd, Jean Horn, Brian Hornby, Dwayne Jenkins, Ulf Johansson, Derek Johnson, Rhonda Johnson, Sharilyn Johnson, Edgar Jones, Jean Jones, Stefan Junkind, Chris Kabel, Janos Kovacs, Doug Krystofiak, Susan Laiss, Jim Lange, Mal Landry, Carolyn Lastiwka, Ingrid Law, Doreen Letain, Ed Letain, Marie Lewis, Phyllis Lockett, Marguerite Lomow, Fran Losie, Dave Low, Gerry Lunn, Jim MacGregor, Monette Malley, Av Mann, Pat Markelevitz, Susan McDaniel, Colin McIntyre, Lloyd McLeod, Rudy Melnychuck, Amylee Milke, Doris Milke, Andy Miller, John Moore, Bruce Morrison, Dave Nadeau, Richard Nesby, Barb Nicholson, Lorraine Oake, Kevin Okraintz, Tyler Okraintz, Elson Olorenshaw, Ben Olsen, Carla Palaschuk, Dave Palsat, Jack Park, Mark Piorecky, Sharon Pomeroy, Don Pluth, Claire Radke, Brian Ritchie, Teresa Scholer, Alf Scott, Christine Seiber, Michael Seiber, June Seidel, Doug Shaw, Jim Shewfelt, Ruth Shewfelt, Ken Sloman, Harry Stelfox, Orrin Stephen, David Stepnisky, Dena Stockburger, Lisa Takats, Jean Taylor, Terry Thormin, Martin Timmens, Sandy Tober, Roy Trace, Angie Tremblay, Ed Tremblay, Dann Vanpelt, Heather Vanpelt, Tammy Vanpelt, Jyi Varghese, Doug Wahlsten, Berry and Eric Wallace, Fred Whiley, Maurice White, Bob Winship, Graham Yeomans, Michael Yeomans, Don Zander.

Elk Island: Dec. 27. Compiler: Geoff Holroyd, CWS, 4123 - 122 Street, Edmonton, AB T6& 1Z1. Participants: Elisabeth Beaubien, Suzanne Benoit, Bob Carroll, Judy Cornish, Vincent Cottrell, Ross Dickson, Evelyn Henke, Karsten Henke, Jim Henry, Geoff Holroyd, Brian Hornby, Jim Lange, Jack Park, Teresa Scholer (Edmonton Natural History Club, Friends of Elk Island Society).

Erskine: Jan. 2. Compilers: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0 and Carol Simpson, #20 Emmerson Acres, Stettler, AB T0C 2L2. Participants: Ann and Charlie Bird, John Brennen, Roger Burmeister, Allen and Bertha Clarke, Arlie and Tanya Fishback, John Hadley, Orville Hanna, Dale Jackson, Martha and Ron Kruger, Samantha Kudras, Lloyd Lohr, Bill and Mary Muhlbach, Evelyn O'Hara, Ron Rouse, Carol and Les Simpson, Lola Stewart, Elaine and Tom Verdonk, Marlene Walentowitz.

Fish Creek Park: Jan. 1. Participants: Bruce Harding, Mike Prosyiak, Jim Washbrook, Ken Oakes, Penny and Graham Smith, Jeff (co-compiler) and Angela Gottfred, John and Wilma Dase, John Blytke, Sue and Russ Costello, Bill Walker (co-compiler).

Fort McMurray: Compiler: Helen Pacholko, 109 Silverdale Garden, Fort McMurray, AB T9H 3S6.

Fort Vermilion: Dec. 11. Compiler: Wendy Carpenter, Box 291, Fort Vermilion, AB T0H 1N0.

Gilbey: Dec. 19. Participants: Allan Anderson, Don Hughes, Len Stoness.

Grande Prairie: Dec. 19. Compiler: Andy Raniseth, 10028 - 87 Avenue, Grande Prairie, AB T8V 0B4. Participants: Doreen Cooke, Lawrence Chandler, Tony Graham, Margot Hervieux, Joan Kerr, Harry Lehners, Ken Nash, Andy Raniseth, Marilyn Raniseth, Moira Sheehan, Jeanne Smith, Clark Wolff, Kay McNally, Gwen Richards, Alf Richards, Joyce Mann, Jack Mann.

Gull Lake: Dec. 19. Compilers: Percy and Jessie Palmer. Participants: Mary and Bert Baker, Joanne, Kane and Darlene Bell, Lloyd Beze, Beatrice Burles, Vivian Busat, Lorne Cittert, Frank Fraser, Eileen Freeman, Keith Freeman, Gordon and Lois Galbraith, Roy and Laurene Gillard, Muriel and Herb Harriman, Bill Hiusman, Pearl Johnston, J Kanngiesser, Richard Matthews, Ruth McPhee, Fred and Maybelle Moffard, Marie Morrison, Sharon Murphy, Terry Nelson, Percy and Jessie Palmer, Joyce Paull, Barry and Wendy Raymond, Alfred and Florrie Skjonsberg, Allan and Jean Smellie, Case Spelt, Allan Stolte and Family, Darren Unwin, Calvin Vig, June Wiese.

Haynes: Dec. 19. Participants: Jim, Anna, Patrick and Alissa Robertson.

Hinton: Dec. 26. Compiler: Beth MacCallum, 110 Seabolt Drive, Hinton, AB T7V 1K2. Participants: Beth MacCallum, Barry Godsalve, Dave Hobson, Karen Aldred, Len Aldred, Barb Levesque, David Levesque, Lise Levesque, Fran Hanington, Jacquie Hanington, Orville Cook, Tammy Cook, Neil Anderson, Wendy Anderson, Norma Bonar Vern Truxler, Norm Keil, Lorraine Keil, Ernie Masanchuk, Max Kudrenecky, Gwen Kudrenecky, Mariette Lyons, Bob Lyons, Herb Scott, Sharon Scott, Clare Armstrong, Brenda Armstrong, Marg Stafford, Lloyd Stafford, Laura Simmonds, Peggy Allen.

Horseshoe Canyon: Dec. 18. Compiler: Robert W. Storms, 184 Riverbirch Road S.E., Calgary, AB T2C 3N2. Participants: Tom Bishop, Luke, deWit, Roger Dunn, Brian Elder, Mike Harrison, Al Kimberley, John Riddell, Peter Sherrington, Wayne Smith, Milt Spitzer, Bob Storms, Bill Taylor, John Thompson, Richard Trahan, Howard Troughton, Merril Wershler, Ray Wershler.

Kimiwan/McLennan: Jan. 2 Compiler: Louise Faulkner, P.O. Box 420, McLennan, AB T0H 2L0. Participants: Anne Brassard, Barbara Christen, Eckard, Christen, Diane Deslauriers, Richard Deslauriers, Louise Faulkner, Ronald Faulkner, Pauline Gervais, Robert Hugill, Francis Lessard, Marion Lessard, Alice MacMillan, Ted MacMillan, John O'Mahony, Phillipa O'Mahony, Lorenne Owens, Bob Simpson, Marlene Simpson, Norma Sobolewski, Anne Trotter, William Trotter, Alex Welch, Ida Welch, Peter Welch.

Kneehills Valley: Dec. 19. Participants: Catherine and Davie Bartlett, Dorothy Dickson.

Lac La Biche: Dec. 18. Compiler: Richard G. Thomas, Box 1815, Lac La Biche, AB T0A 2C0. Participants: Phil Cohen, Sandy Cohen, Brian Deheer, Ross Dickson, Dave Finn, Ted Johnson, Bryanna Kumpula, Michael Kuprowsky, Tom Maccagno, Edith Middleton, Roy Middleton, Ursula Schroeder, Gerry Steedsman, Karen Stroebel, Len Stroebel, Jerry Sykes, Richard Thomas, Jodey Timoffee, Noreen Hodgins, Al Jackson, Irene Jackson, Jan Kuprowsky, Mel Kuprowsky, Cal Lockhart, Annette Maccagno, Clara McArthur, Gerry Steedsman, Vi Sykes, Darliene Takacs, Hank Turchin, Dave Winger, Joyce Winger, Harvey Yoder.

Lacombe: Dec. 19. Participants: Colleen Graham, Andy Murphy, Bea Pierce, Sam, Joan and Joanne Susut, Kayla Thievin.

Lethbridge: Dec. 27. Compiler: Graeme Greenlee, 2018 - 23 Avenue South, Lethbridge, AB T1K 1K6. Participants: Bruce and Lloyd Bennett, Louie Brandsma, Anne and Bill Brown, Linda Cerney, Doug and Teresa Dolman, Wayne Dwornik, Andrew and Witold Gierulski, Edith, Graeme and Pat Greenlee, Dick Gwatkin, Archie, Ben, Chris, Danny, Nathan and Erin Hafichuk, Victor and Marilyn Hafichuk, Harcourt Hobbs, Betty and George Luco, Ted Lundstad, Chris Magosse, Janet, Jennifer and Lynn Mather, Lyman Matthews, Emily, Katie and Laure Neish, Ken Peddie, Alan Roberts, Alex, Frank and Katharine Russell, Mike Spencer, Doug Walker, Jessica, Joyce and Paul Wilkinson, Diana Williams, Bill and Susan Yates.

Medicine Hat: Dec. 19. Compiler: Dennis Baresco, 266 - 7 Street S.E., Medicine Hat, AB T1A 1J6. Participants: Linda Canham, Dawn Dickinson, Delphine Fortin, Matthew Horch, Phil Horch, Jim Marshall, Lorine Marshall Darcy MacNeil, Beth Milne, Gordon Milne, Cheryl Moller, Peter Mehrer, Garry Newton, Mark Oxamitny, Dorothy Robertson, Dan Schiebelbein, Charlene Skidmore, O. Templin, Bill Tidy, Ruth Tidy, Ben Velner, Michael Velner, Arnie Vorreiter, Bob Frew, Florence Havill.

Olds: Dec. 19. Participants: Don and Marge Findlay.

Penhold: Dec. 19. Participants : Russell Bennet, Dave Bott, Stewart and Eileen Ford.

Pine Lake: Dec. 19. Participants: Brian and Caroline Harris, Herb and Helen Harris, Ron and Margaret Underwood.

Ponoka: Dec. 19. Compiler: Murray Mackay, 5217 - 58 Avenue, Ponoka, AB T4J 1G4. Participants: Elmer and Joyce Hageman, Mildred Lyons, Margaret and Murray Mackay, Mr. and Mrs. Harry Beddingfield, Margaret and Bill Baille, Margaret Brown and family, Tony Vandenberg and family, Peggy Battern, Mr. and Mrs. Len Rowland, Kerry Vaughn, Mr. and Mrs. Merv Mattern, Shiela and George Debney, Bob and Doreen Ross, Don Cameron, Rod and Rena Hermanson and family, Mr. and Mrs. Eric Osterguaard, Elaine Gill, Larry Lentz, Mr. and Mrs. Herb Eilenstien, Carolyn and Niel Macaulay, Allister and Nancy MacKenzie.

Rainbow Lake: Dec. 18. Compiler: Michael Amann, Box 425, Rainbow Lake, AB T0H 2Y0. Participants: Lynn and Michael Amann, Bev and Hugh Dennis, Danielle and Vicki Brockhart, Adiva, Les and Tracie Friesen, Mike Templeton, Therese Yacyshyn, Abbie, Danien and Carolyn Bryanton, Scott, Marie, Emily and Simon Neville.

Red Deer: Dec. 19. Compiler Tom Pierce, Red Deer River Naturalists, P.O. Box 785, Red Deer, AB T4N 5H2. Participants: Peggy Anderson, Jim Caddy, Minnie Cunningham, Ursula and George, Fedak, Charles Fox, John Grutter, Dorothy Hazlet, Alice Hogan, Clark Johnston, Delores Jones, Donna Kafara, Joyce Krossa, Keith Kline, Gene Kozowy, Joan Lamb, Pat Marcellus, Dorothy and Sandy Murray, Ione Napper, Terea Newman, Maxine O'Riordan, Myrna Pearman, Lyle Richards, Jim and Patrick Robertson, Jason Rogers, Walter and Nellie Savage, Sherry Scheunert, Pete and Beryl Steele, Jeff Stoko, Rod Trentham, Kevin, Thea and Doreen Wingert, Kerry and Marjorie Wood.

Rimbey: Dec. 19. Participants: Ed Brown, Earl and Mary Eadie, Frank and Olga Lind, Wilf and Suzie Wiese.

Rocky Mountain House: Compiler: Darrell Smith, Box 1720, Rocky Mountain House, AB T0M 1T0.

St. Albert: Dec. 27. Compiler: Peter Demulder, 47 Geneva Crescent, St. Albert, AB T8N 0Z3. Participants: Bob and Gail Lane, Fin and Peggy Fairfield and family, Roger Edwards, Alice Hendrey and son, Jaspe Keizer, Rick and Deanne Morse, Paul Wadden, Don Maine, Deirdre Demuler, Jill Demuler, Ludo Bogaert, Lyle and Marie McCann, Anne Conlin, Pat Sturgess, Jak Stell, Mel, Laurane, Nathan, Adam, Breanne and Jordan Landry, Ed and Muriel Toop, Peggie Mair, Wilma Turkington, Jackie Willier, James and Pattie Webb, Peter Demulder, Hugh Smith, Phil Sturgess, Ruth Horne, Mary Anderson, Doreen Row, Dave Nadeau, Allan, Amy Stephen and Andre Hingston, Harvey and Cath Krosmanich, Bruce and Erin Cameron, Don and Scott Gerylo, Ron Hollingworth, Dave, Carrie and Doug Organ, Maureen Bell, Chris and Amy Wook, Larry and Sandra St. Croix, Louise Horstman, Ted Code, Doroty McNeill, Bocock family, Derek and Christie Chaston, Sharon Dyer, Jo-Anne Kells, Barry and Beth Jenkins, Mary Anderson.

St. Paul: Dec. 19. Compiler: Blair Rippin, 5121 - 45 Avenue, St. Paul, AB T0A 3A4. Participants: Velma Hudson, Floyd Kunnas, Dick Brown, Roland Decosse, Ray Makowecki, Paul Makowecki, Marshall Hopkins, Toni Hopkins, Dennis Griggs, Joslyn Giggs, Kevin Potter, Keith Pugh, Dave Moore, Paul Boisvert, Gladys Boisvert, Steve Montgomry.

Sheep River: Jan. 2. Compiler: Doug Collister, 3426 Lane Crescent S.W., Calgary, AB T3E 5X2.

The Snake's Head: Dec. 31. Compiler: Doug Collister, 3426 Lane Crescent S.W., Calgary, AB T3E 5X2.

Stettler: Dec. 19. Co-compilers: Lloyd Lohr, Box 1414, Stettler, AB T0C 2L0 and Carol Simpson, #20 Emmerson Acres, Stettler, AB T0C 2L2. Participants: Dorothy Brownlee, Roger Burmeister, Hugh and Nora Charles, Peter Cooper, Bernice, June, Lloyd and Tim Greenlee, Elmer Gross, Bud and Sonia Haddow, Lawrence Kennedy, Eva Kirtley, Agnes and Rolf Lehman, Bea and Marvin Lohr, Lloyd Lohr, George and Grace Neill, Roy Payne, Carol, Davis and Les Simpson, Bertha Smith, Art Stack, Marlene Walentowitz.

Sylvan Lake: Dec. 19. Compiler: Myrna Pearman, Box 127, Sylvan Lake, AB T0M 1Z0. Participants: Doreen Insinger, Myran Pearman, Beth Peck, Heather Sjare, LaVerne and Emily Skinn, Orville and Berry Van Slyke.

Tofield: Dec. 31. Compiler: Patricia Jones, Box 29, Tofield, AB T0B 4J0. Participants: Roy and Marg Berg, Roy and Travis Fairweather, Pat Jones, Peter, Linda and Eric Kershaw, Pat Nolan, Ed Regher, Sheila Brown, Russel Johnson, Kyle Morrison, Nicole Lindberg, Amanda and Julie Tripp, Wesley Oomen, Ray Peterson, Fred and Helen Thompson, Mike Yaciuk.

Trapline: Dec. 19. Compiler: Ellen Craig, R.R. #1, Wembley, AB T0H 3S0. Participants: Gavin and Ellen Craig.

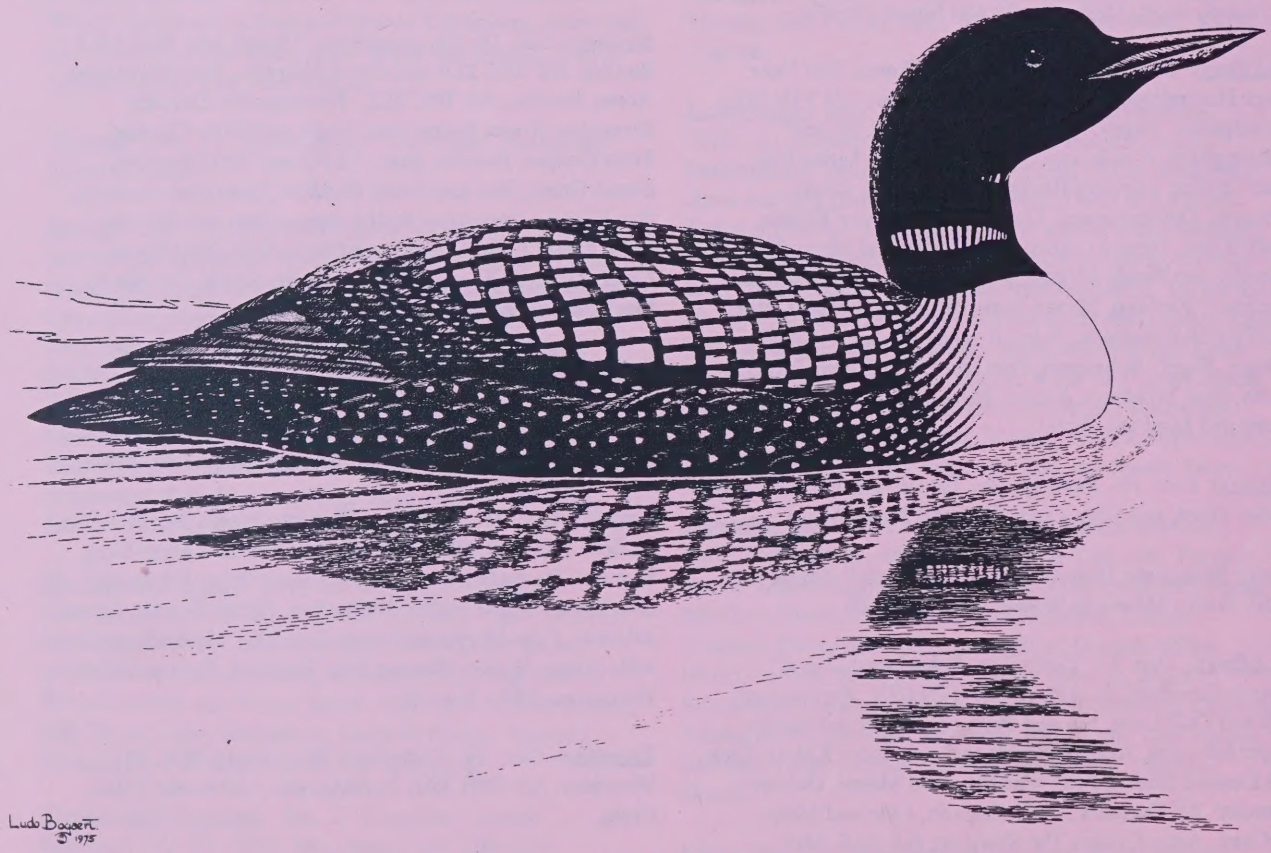
Vermilion: Dec. 18. Compiler: Iris Davies, Box 93, Dewberry, AB T0B 1G0. Participants: Walter and Dorine Dietz, Hillary Tarrant, Stu and Anne Heard, Pam and Christopher King, Wayne and Marilyn Campbell, Ralph and Iris Davies, Mary Ternoster, Valery Hawkins, Stan Geake, Walter and Jan Scott, Helen King, Dennis and Aubrey Berdine.

Wabamun Lake: Jan. 2. Compiler: Alan Hingston, 53 Wakefield Blvd., St. Albert, AB T8N 3G1. Participants: Jim and Barb Beck, Kim Clark, Dick and Pat Clayton, Vince Cottrell, Peter Demulder, Ross Dickson, Alan Hingston, Wes Hochachka, Stefan Jungkind, Wade Kisko, Dan Kornak, Jim Lange, Gerry Lunn, Ed Mah-Lim, Pat Marklevitz, Dave Nadeau, Jack Park, Evan Pye, Thomas Roach, Alf Scott, Terry Thormin, Sabrina Trapin, Fred Whiley, Michele Williamson.

Waterton Lakes: Dec. 18. Compiler: Teresa Dolman, 37 Carleton Road West, Lethbridge, AB T1K 3X4. Participants: Ray and Shirly Baker, Lloyd and Bruce Bennett, Dale and Paul Baumback, Andrew Bosna, Cheryl Bradley, Linda Cerney, Teresa and Doug Dolman, Lorne Fitch, Witold Gierulski, Graeme and Patty Greenlee, Betty Haig, Charlene Haley, Andrew Hurly, Dan Lee, Lois McKillop, Ross, John Linnea and Laura Munro, Laure and Emile Neish, Doris Rhodes, Liz Savoy, Bill Sharp, Shirley Sillitto, Janice, Fraser, Jesse and Tyler Smith, Jean Syroteuk, Rob Watt.

Wembley: Dec. 18. Compiler: Ellen Craig, R.R. #1, Wembley, AB T0H 3S0. Participants: Gavin and Ellen Craig, Craig Dahl.

Wildlife Reserve: Dec. 27. Compiler: Jamey Podlubny, 3516 - Street N.W., Calgary, AB T3B 5E8. Participants: Mairi Babey, Joanne Black, Carol Bishop, Tom Bishop, Doug Collister, Gary Clarke, Olga Droppo, Jean Dunn, Rodger Dunn, Ingrid Ektvedt, Brian Elder, Sonja Filyk, Don Greenfield, Horst Grothman, Judy Grothman, Bud Henning, Joanne Henning, Clay Hunt, Randy Lauff, Ed Mah-Lim, Karen McCullough, May Parker, Jamey Podlubny, John Riddell, Lorelei Roll, Barbara Sherrington, Peter Sherrington, Wayne Smith, Elaine Spitzer, Milt Spitzer, Don Stiles, Bob Storms, Ted Straiton, Richard Thomas, Howard Troughton, Mike Veloski, Suzanne Walsh, Merril Wershler, Ray Wershler, Dan Wicklum.



Alberta Christmas Bird Counts 1993

LOCALITY	Banff/ Canmore	Beaverlodge	Berwyn	Bow Kan	Bow Summit	Buffalo Lake	Calgary	Cardston	Caroline	Claresholm	Coyote Lake	Crestomere
SPECIES												
Canada Goose				2			4186	200				
Mallard	1106			8			22138					
Common Goldeneye	137			32			2542					
Common Merganser	1						80					
Bald Eagle	1	1	2	1			12	6				
Northern Goshawk	1	1		1			2					
Rough-legged Hawk		1					5	12		73		
Golden Eagle								2		9		
Merlin							10	2		2		
Gyrfalcon		1										
Prairie Falcon							4	1		5		
Gray Partridge			7				61			57	1	
Ring-neck Pheasant						2	22			5		
Ruffed Grouse	2	2		3		3	1		4	1	3	
Sharp-tail Grouse		13					2			3	2	
Rock Dove	1	216	5	50		9	1665	50	19	230	30	
Great Horned Owl	1	2	1			1	14	5	1	9	1	
Snowy Owl							3	13		7		2
Northern Hawk Owl											1	
Great Gray Owl		1									1	
Short-eared Owl			1				3	3		11		
N. Saw-whet Owl		1	2								2	
Downy Woodpecker	19	5	9	5		27	120	2	10	8	14	1
Hairy Woodpecker	22	6	8	4		21	28	1	13	3	18	2
Thr.-toed W'pecker	2		2									
Northern Flicker							38	3		5		
Pileated Woodpecker							3	1			6	
Horned Lark								2		136		
Gray Jay	70	12	11	69	6			3	12	2	44	
Blue Jay	9	40	51			13	128		12	8	58	4
Black-bill Magpie	175	59	41	49		52	2266	57	9	186	34	11
American Crow	22			13			32	1	4			
Common Raven	340	107	53	76	4	1	150	15	38	19	122	
Black-Cap Chickadee	214	76	90	79		201	973	18	83	24	229	13
Mountain Chickadee	175			68				1		1		
Boreal Chickadee	99		8	38	3		39		7		52	
Red-br. Nuthatch	38	3	1	5		2	116	10		4	6	
White-br. Nuthatch	8	6					59		14	3	12	
Brown Creeper	5		11				12		1			
American Dipper	28			66			5					
Golden-cr. Kinglet	6			21			27			5		
American Robin	1						26					
Bohemian Waxwing	441	101	23	211		1	1986			210	400	
Cedar Waxwing							42			7		
Northern Shrike		1	1				5	2		2	2	
European Starling		96	24				1077	3		106	45	
Am. Tree Sparrow							1					
Dark-eyed Junco	23						42					
Snow Bunting		220	44	250		3			87	34		
Pine Grosbeak	35	60	13	2		1			10		17	
Red Crossbill										1		
Wh.-wing Crossbill	63				12		146				25	
Common Redpoll	22	911	64	2		105	726	4	205	142	142	27
Hoary Redpoll		27	20				1				10	
Pine Siskin	13						27			1	9	
Evening Grosbeak	118		38				5		35		36	
House Sparrow	266	532	115	31		150	4155	175	73	407	63	59
TOTAL COUNTS:												
Birds & Five +/-	3585	2506	646	1144	26	592	43063	597	639	1746	1387	119
Total Species	43	29	27	30	5	16	62	29	20	38	31	8
Participants	54	16	23	50	2	27	173	9	10	14	22	4

Alberta Christmas Bird Counts 1993

LOCALITY	Cypr's Hills	Devon/ Calmar	Dickson Dam	Drayton Valley	Eagle-sham	Eck-ville	Edmonto	Elk Island	Erskine	Fish Cr Park	Ft.Mc-Murray	Ft.Ver-milion
SPECIES												
Canada Goose										1460		
Mallard							70			530		
Common Goldeneye			2	75			275			362		
Common Merganser				8						8		
Bald Eagle			1	1						2		
Northern Goshawk		1					6	1				
Rough-legged Hawk	1		1				5			1		
Golden Eagle												
Merlin		1					17					
Gyrfalcon		1					1			1		
Prairie Falcon												
Gray Partridge							48					
Ring-neck Pheasant		13	1				10			5		
Ruffed Grouse		4		2				15			9	5
Sharp-tail Grouse												20
Rock Dove		101	77		8		3392	14	52	2		20
Great Horned Owl	2	1					30	3	6		4	
Snowy Owl	1	1					24					
Northern Hawk Owl												
Great Gray Owl			1									4
Short-eared Owl												
N. Saw-whet Owl							26					
Downy Woodpecker	6	27	5	2		2	167	19	8	12	24	2
Hairy Woodpecker	2	15	2	2	7	1	86	22	11	6	50	3
Thr.-toed W'pecker							3				1	
Northern Flicker							35			1		
Pileated Woodpecker		3					15	2			4	
Horned Lark	6											
Gray Jay			4	13	1						62	3
Blue Jay		55	16	4	14	3	926	56	6	7	108	4
Black-bill Magpie	43	91	19	3		3	3131	68	128	53	36	8
American Crow	2						24	2			2	2
Common Raven		36	5	15	1		21	16	3	6	672	25
Black-Cap Chickadee	49	341	111	23	14	8	4336	324	158	141	242	21
Mountain Chickadee												
Boreal Chickadee		15	23				52	29		12	99	2
Red-br. Nuthatch	1	3					453	30		10	50	
White-br. Nuthatch		15	8			2	188	24		10		
Brown Creeper							6	2		1		
American Dipper				2						2		
Golden-cr. Kinglet							2	5		1		
American Robin							37					
Bohemian Waxwing		208	40		25		374	220	58	200	120	
Cedar Waxwing							127					
Northern Shrike	1	1					4	2	4			
European Starling		71					484				8	
Am. Tree Sparrow							11					
Dark-eyed Junco		1					155	1			18	
Snow Bunting	5094		10	46			7	5	387		66	11
Pine Grosbeak		14	20	16	21	6	71	26	1		634	93
Red Crossbill							5				15	
Wh.-wing Crossbill		164					486	45			60	
Common Redpoll		467	42	112	30	75	929	1054	63	17	646	176
Hoary Redpoll		2		3			23	19			90	5
Pine Siskin		4					225	24			17	
Evening Grosbeak		88		12	40		27	43			491	28
House Sparrow		336	37		70		7386	39	248	7	141	2
TOTAL COUNTS:												
Birds & Five +/-	5208	2081	429	340	232	100	23729	2110	1133	2861	3674	434
Total Species	12	30	22	18	12	8	53	28	14	27	28	19
Participants	17	23	13	1	4	2	605	14	25	14		16

Alberta Christmas Bird Counts 1993

LOCALITY	Gilbey	Grande	Gull	Haynes	Hinton	H'shoe	Kimiwan	Kneehil	Lac La	Lacombe	Leth-	Med'
		Prairie	Lake			Canyon	McLenna	Valley	Biche		bridge	Hat
SPECIES												
Canada Goose											2584	3037
Mallard											1976	614
Common Goldeneye											194	142
Common Merganser												10
Bald Eagle	2	2	1								15	9
Northern Goshawk		1			1	8		1				
Rough-legged Hawk		3					1				11	2
Golden Eagle						1					1	4
Merlin						2			1	1	5	3
Gyrfalcon										2		
Prairie Falcon				1		1					3	
Gray Partridge	13		17								49	27
Ring-neck Pheasant						12					20	26
Ruffed Grouse	3		2	1	2			1	7			
Sharp-tail Grouse		4					1		6		10	1
Rock Dove	89	135	239	15		63	7	8	11		503	1064
Great Horned Owl		2	8	3		3			1	3	22	5
Snowy Owl		2	4	1		1	2		1		8	2
Northern Hawk Owl			2									
Great Gray Owl												
Short-eared Owl		3				1						
N. Saw-whet Owl												
Downy Woodpecker	6	6	58	1	2	17	7	2	24	3	24	11
Hairy Woodpecker		16	31		2	6	8		22	2	7	2
Thr.-toed W'pecker					1							
Northern Flicker											15	26
Pileated Woodpecker			2				1		2			
Horned Lark											6	4
Gray Jay		17			28		20		13			
Blue Jay	13	25	69	1	17	19	76	1	70	13	8	
Black-bill Magpie	13	59	124	18	57	265	61	14	58	13	274	694
American Crow			2		1		1				22	
Common Raven	3	58	31	1	421	4	97	2	199	4		
Black-Cap Chickadee	166	111	776	29	134	190	102	30	231	59	104	63
Mountain Chickadee												
Boreal Chickadee		1	24		47				19	8		
Red-br. Nuthatch		6		1	40	181	2		65	1	16	47
White-br. Nuthatch	7	5	40		4	6	1		13	1	6	2
Brown Creeper			2		1	9					2	1
American Dipper					1							
Golden-cr. Kinglet					1	94			3		7	
American Robin			4			9					1	5
Bohemian Waxwing		1259	420	13		145	35		28	80	67	6
Cedar Waxwing			124								2	7
Northern Shrike		1				4	1	1	1		4	5
European Starling		10				90	12			1	164	167
Am. Tree Sparrow						1					39	38
Dark-eyed Junco									1		10	47
Snow Bunting		91	130	70	50	551	20		193	300	1	21
Pine Grosbeak		78			17		198		72			33
Red Crossbill											8	
Wh.-wing Crossbill		46			73	720			26			
Common Redpoll	201	190	1024		16	1274	278		391	37	96	173
Hoary Redpoll		2	57			5	26		6		1	2
Pine Siskin							60					42
Evening Grosbeak		32	53	12	12		74		423	35		
House Sparrow	81	305	393	20	58	190	89	17	76	45	857	1200
TOTAL COUNTS:												
Birds & Five +/-	597	2470	3637	188	987	3873	1181	77	1966	608	7180	7560
Total Species	12	28	26	16	24	30	26	10	30	18	46	43
Participants	3	12	55	3	32	17	24	3	32	8	48	26

Alberta Christmas Bird Counts 1993

LOCALITY	Olds	Penhold	Pine	Ponoka	Rainbow	Red	Rimbey	Rocky	St.	St.	Sheep	Snake's
			Lake		Lake	Deer		Mtn.Hse	Albert	Paul	River	Head
SPECIES												
Canada Goose						4						
Mallard						2				1		
Common Goldeneye						9						
Common Merganser						1						
Bald Eagle						3		1			4	1
Northern Goshawk										1	4	
Rough-legged Hawk						1			4		20	8
Golden Eagle											3	1
Merlin			1						3			
Gyrfalcon		1										
Prairie Falcon												
Gray Partridge				9			4		5			
Ring-neck Pheasant				1					1			
Ruffed Grouse		1		4	1	2	3	5	1	2	6	10
Sharp-tail Grouse										1		
Rock Dove	47	14		121		53	4	15	706	250	2	58
Great Horned Owl	1		1	3		2			2		4	1
Snowy Owl		5	1	8			1		27			
Northern Hawk Owl									1		3	
Great Gray Owl								2		1	1	2
Short-eared Owl												
N. Saw-whet Owl				1								
Downy Woodpecker		5	3	21	5	29	9	36	27	6	37	35
Hairy Woodpecker			2	19	2	20	7	23	16	12	25	28
Thr.-toed W'pecker								1			3	5
Northern Flicker				1		2		9	7			
Pileated Woodpecker				2		7	1	2	5		8	10
Horned Lark												
Gray Jay				2	19		6	45	1	2	158	91
Blue Jay	5	6		37		79	16	55	121	24	24	95
Black-bill Magpie	4	19	1	103		197	8	42	405	98	177	150
American Crow								12	1		2	2
Common Raven				10	131	12	9	42	1	10	164	236
Black-Cap Chickadee	46	42	34	268	22	450	94	230	556	111	548	542
Mountain Chickadee											29	
Boreal Chickadee				10	4	25	6	54	5	8	181	251
Red-br. Nuthatch				2		5		7	36	1	22	5
White-br. Nuthatch		2	1	27		14	7	30	28	2	8	29
Brown Creeper								3			16	2
American Dipper											7	2
Golden-cr. Kinglet						1					17	7
American Robin				1								2
Bohemian Waxwing		30		165		35	26	371	76	96	9	31
Cedar Waxwing	7			1		82			18			
Northern Shrike		1				1			1	4	7	3
European Starling				105		32	20	25	25	22		26
Am. Tree Sparrow								7	1		4	6
Dark-eyed Junco				1		3		6	3	4	2	2
Snow Bunting				70	64	500	200	305		343	1	948
Pine Grosbeak				12	44	4	45	86	17	50	7	17
Red Crossbill				12								
Wh.-wing Crossbill						15			79		5	19
Common Redpoll	57	66	6	474	9	216	78	299	166	119	842	990
Hoary Redpoll				3		3			1	25	7	3
Pine Siskin	3					2		39	1	16		4
Evening Grosbeak		12		193	9	13	190	288	31	13	10	85
House Sparrow	76	12	20	461	43	157	103	16	724	627	218	45
TOTAL COUNTS:												
Birds & Five +/-	246	216	70	2147	354	1982	837	2056	3104	1849	2626	3770
Total Species	9	14	10	31	13	35	21	29	36	27	41	41
Participants	2	4	6	44	18	39	6	41	71	18	21	24

Alberta Christmas Bird Counts 1993

LOCALITY	Stettler	Sylvan Lake	Tofield	Trapline	Vermilion	Wabamun Lake	Waterto Lakes	Wembley	Wildlife Reserve		TOTAL
SPECIES											
Canada Goose											11473
Mallard						161	1				26607
Common Goldeneye						446	5				4221
Common Merganser						9	1				118
Bald Eagle					1		1	8	2		77
Northern Goshawk			1			4			4		38
Rough-legged Hawk				1			1	4	5		160
Golden Eagle									1		22
Merlin											48
Gyrfalcon											7
Prairie Falcon											15
Gray Partridge					12						310
Ring-neck Pheasant	2		4		1						125
Ruffed Grouse	1	11	1			4		6	19		147
Sharp-tail Grouse					25	1	1		4		94
Rock Dove	34	8	149		161	20			103		9820
Great Horned Owl	2	3	5		3	29	2	1	5		192
Snowy Owl	1				5			3	1		124
Northern Hawk Owl						2			1		10
Great Gray Owl						2			4		19
Short-eared Owl									1		23
N. Saw-whet Owl						4					36
Downy Woodpecker	15	8	19		9	57	3	4	39		1022
Hairy Woodpecker	15	8	16		4	36	5	5	22		694
Thr.-toed W'pecker							1		10		29
Northern Flicker											142
Pileated Woodpecker	2	1	1	2	1	11		1	5		98
Horned Lark								35			189
Gray Jay				2		38	11		143		908
Blue Jay	12	20	30		33	141		12	73		2617
Black-bill Magpie	116	28	79		114	87	22	54	129		10005
American Crow					1	3					151
Common Raven		4	5	10	1	73	14	166	327		3760
Black-Cap Chickadee	178	124	297	1	73	1099	16	40	447		14981
Mountain Chickadee							3		20		297
Boreal Chickadee					1	80	6		144		1352
Red-br. Nuthatch	1	2			8	12	2		9		1203
White-br. Nuthatch	4	8	11		1	42	1		16		665
Brown Creeper						1			6		81
American Dipper							10		5		128
Golden-cr. Kinglet						5			6		208
American Robin											86
Bohemian Waxwing	2	20	147		23	3762		350			11814
Cedar Waxwing		63	6								486
Northern Shrike					2	7	1	3	4		76
European Starling		8			7	6		20	2		2656
Am. Tree Sparrow									1		109
Dark-eyed Junco						2	2		4		327
Snow Bunting	50		70		63	113	21	15	300		10754
Pine Grosbeak	1		5	1		134		5	28		1894
Red Crossbill						1					42
Wh.-wing Crossbill					1	133		5	3		2126
Common Redpoll	97	67	34	10	163	1127		550	1020		16031
Hoary Redpoll		3	90			34		6	1		475
Pine Siskin		10				24			1		522
Evening Grosbeak	8	13	11			199			102		2779
House Sparrow	245	30	275		382	90		10	183		21340
TOTAL COUNTS:											
Birds & Five +/-	786	439	1256	27	1096	8039	139	1306	3203		164253
Total Species	19	20	21	7	26	54	26	25	41		112
Participants	28	8	21	2	19	26	36	3	40		1878

Species Recorded on Five or Fewer Counts

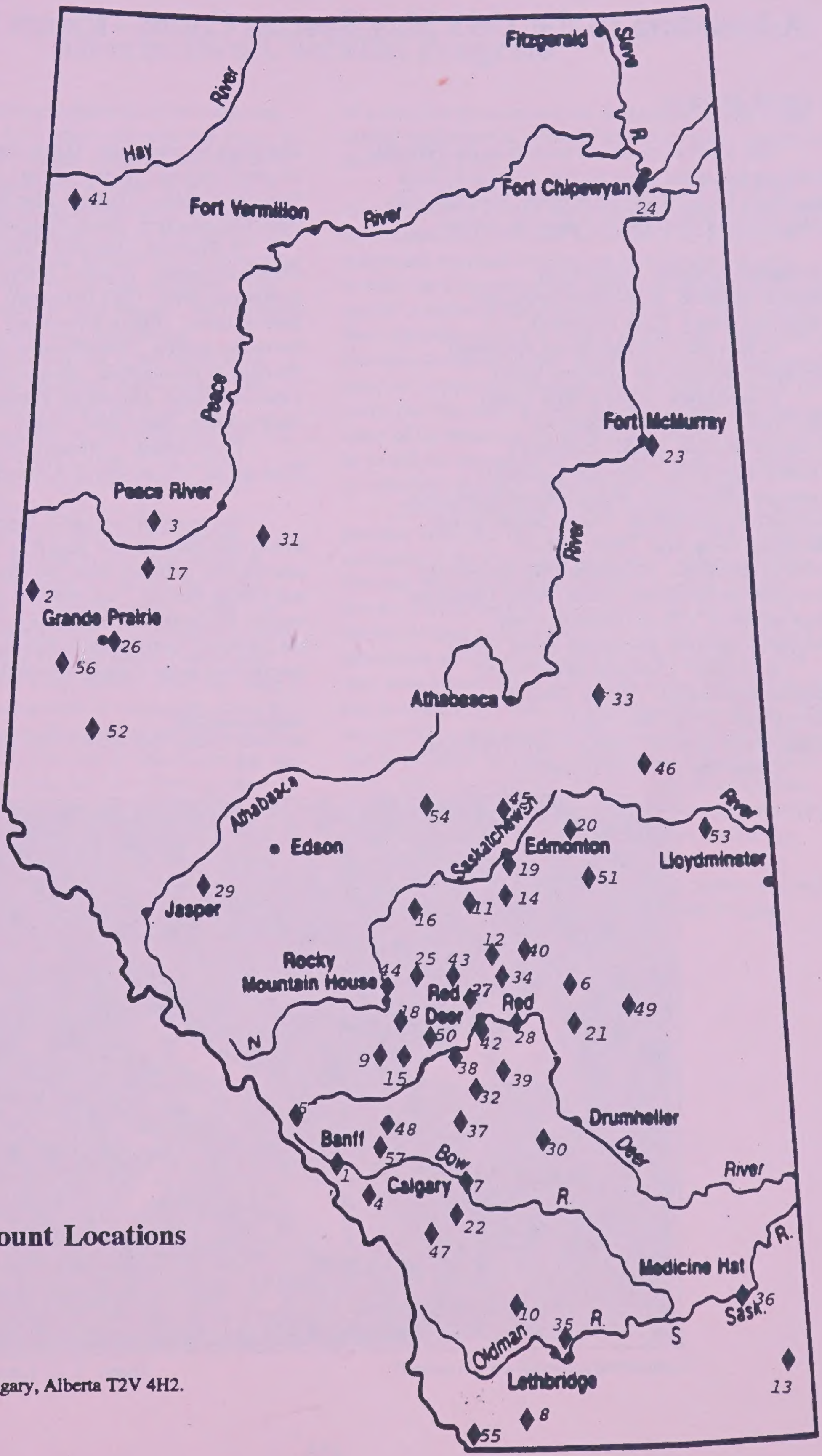
Species	Counts Recorded
Pacific Loon	Calgary 1
Horned Grebe	Wabamun Lake 1
Double-crested Cormorant	Wabamun Lake 1
Great Blue Heron	Edmonton 1
Swan Sp.	Wabamun Lake 2
Snow Goose	Medicine Hat 3
Green-winged Teal	Calgary 3; Edmonton 2
American Black Duck	Calgary 1
Gadwall	Calgary 3; Lethbridge 1; Wabamun Lake 1
Northern Pintail	Calgary 1; Wabamun Lake 1
Teal Sp.	Bow Kan 1; Wabamun Lake 1
American Wigeon	Bow Kan 1; Wabamun Lake 2
Canvasback	Wabamun Lake 3
Redhead	Wabamun Lake 4
Ring-necked Duck	Wabamun Lake 2
Lesser Scaup	Calgary 1; Dickson Dam 3; Edmonton 1; Wabamun Lake 4
Harlequin Duck	Calgary 2
Barrow's Goldeneye	Banff/Canmore 2; Bow Kan 45; Calgary 17; Fish Creek Park 1
Bufflehead	Calgary 36; Lethbridge 1; Wabamun Lake 8
Hooded Merganser	Calgary 5; Wabamun Lake 7
Duck Sp.	Bow Kan 4
Northern Harrier	Beaverlodge 1; Claresholm 5; Lethbridge 1; Wembley 1
Cooper's Hawk	Lethbridge 1
Sharp-shinned Hawk	Berwyn 1; Edmonton 2
Accipiter Sp.	Waterton Lakes 1
Red-tailed Hawk	Calgary 1
Buteo Sp.	Beaverlodge 1
American Kestrel	Vermilion 1
Peregrine Falcon	Banff/Canmore 1
Hawk Sp.	Cardston 1; Haynes 1; Lac La Biche 1
Spruce Grouse	Drayton Valley 1; Hinton 1; Waterton Lakes 1
Wild Turkey	Claresholm 12
Killdeer	Calgary 1; Fish Creek Park 3; Snake's Head 1; Waterton Lakes 1
Common Snipe	Sheep River 1
Northern Pygmy Owl	Sheep River 2; Snake's Head 1
Barred Owl	Devon/Calmar 1; Wabamun Lake 1; Wembley 1
Long-eared Owl	Beaverlodge 1; Dickson Dam 1; Edmonton 1; Wabamun Lake 1
Boreal Owl	Edmonton 1
Owl Sp.	Beaverlodge 2; Eaglesham 1
Belted Kingfisher	Banff/Canmore 3; Bow Kan 1; Wabamun Lake 1
Black-backed Woodpecker	Coyote Lake 1; Edmonton 1; Lac La Biche 1; Sheep River 3; Wildlife Reserve 2
Woodpecker Sp.	Banff/Canmore 2; Lac La Biche 1; Wildlife Reserve 2
Steller's Jay	Banff/Canmore 1; Caroline 2; Waterton Lakes 6
Clarke's Nutcracker	Banff/Canmore 10; Bow Kan 2; Bow Summit 1; Cardston 1; Medicine Hat 1
Chickadee Sp.	Banff/Canmore 88
Townsend's Solitaire	Banff/Canmore 2; Calgary 1; Edmonton 3; Horseshoe Canyon 1
Varied Thrush	Banff/Canmore 2; Red Deer 1
Yellow-rumped Warbler	Claresholm 2
Pine Warbler	Calgary 1
Song Sparrow	Banff/Canmore 1; Calgary 1; Lethbridge 6
White-throated Sparrow	Banff/Canmore 1; Cardston 1; Edmonton 7; St. Albert 2
White-crowned Sparrow	Bow Kan 3; Medicine Hat 1; Wembley 1

Harris' Sparrow	Medicine Hat 2
Lapland Longspur	Cardston 2
Red-winged Blackbird	Kimiwan/McLennan 1; Lethbridge 6; Medicine Hat 4
Western Meadowlark	Medicine Hat 1
Rusty Blackbird	Coyote Lake 1; Fort McMurray 1; Snake's Head 15
Brewer's Blackbird	Fort McMurray 4; Lethbridge 20; Snake's Head 1
Common Grackle	Lethbridge 2; Medicine Hat 6
Blackbird Sp.	Sheep River 35
Gray-crowned Rosy Finch	Banff/Canmore 6; Rainbow Lake 1
Purple Finch	Calgary 3; Edmonton 10
House Finch	Calgary 1
Redpoll Sp.	Banff/Canmore 2
Brambling	Claresholm 1

Author's Address:
152 Oakside Circle S.W., Calgary, Alberta T2V 4H2.

1993 Christmas Count Coverage and Weather Conditions

Map No.	Count Name	Kms. by Car	Kms. on Foot/Skis	Hrs. by Car	Hrs. on Foot/Skis	Hrs. at Feeders/ Owling	Max. Temp. Deg. C	Min. Temp. Deg. C	Max. Wind Speed Kms./Hr.	Min. Wind Speed Kms./Hr.	Max. Snow Depth Cms.	Min. Snow Depth Cms.
1.	Banff/Canmore	220.50	160.00	14.50	83.00	26.00	-4	-9	27	12	27.5	20
2.	Beaverlodge	551.00	5.50	20.50	3.75	15.00	3	-12	16	0	12	12
3.	Berwyn	322.00	65.50	12.25	39.00	30.50	2	-7	27	0	20	0
4.	Bow/Kan	306.00	131.00	50.50	62.00	30.50	5	-3	65	0	60	0
5.	Bow Summit	67.50	15.50	2.00	7.00	0.00	0	3	8	0	76	71
6.	Buffalo Lake	92.00	11.50	3.30	6.00	31.50	-10	13	6	0	8	8
7.	Calgary	1150.00	285.00	51.00	157.00	505.00	3	-8	32	0	8	0
8	Cardston	460.00	6.00	22.00	8.00	2.00	-5	-20	5	0		
9.	Caroline	66.00	17.00	3.00	5.00	16.50	0	-5	2	1	10	1
10.	Claresholm	380.00	11.00	25.00	4.50	10.00	0	-12	10	0		
11.	Coyote Lake	500.00	10.00	14.00	5.00	12.50	-5	-15	8	0	5	0
12.	Crestomere	20.00	0.00	1.00	0.00	7.50	-1	-2	20	10	10	2
13.	Cypress Hills	116.00	28.00	7.00	26.25	0.00	-15					
14.	Devon	435.00	22.50	0.00	12.00	49.50	-12	-14	5	0	5	0
15.	Dickson Dam	26.00	23.50	1.50	10.50	25.00	2	-12	20	0	12	2
16.	Drayton Valley	180.00	3.00	4.00	2.00	2.00	-3	-10	5	3	15	0
17.	Eaglesham	0.00	0.00	0.00	0.00	16.00	-2	-8				
18.	Eckville	0.00	0.00	0.00	0.00	12.50	-2	-5	0	0	20	7
19.	Edmonton	1536.00	420.50	79.25	262.50	775.25	0	-9	15	2	15	5
20.	Elk Island	337.00	66.00	25.50	37.50	8.00	-7	-12	10	0	10	0
21.	Erskine	377.50	14.50	15.50	6.25	31.00	-5	-22	5	0	10	10
22.	Fish Creek Park						1	-10	8	2		
23.	Fort McMurray						-8		8	2		
24.	Fort Vermilion	250.00	0.00	10.00	0.00	17.00	-6					
25.	Gilbey	30.00	0.00	1.50	0.00	15.00	0	-2	5	0	16	4
26.	Grande Prairie	505.00	22.00	23.00	11.00	17.00	5	-11	20	0	10	10
27.	Gull Lake	170.00	28.00	6.50	14.00	122.50	0	-9	10	5	10	2
28.	Haynes	25.00	0.00	1.00	0.00	2.00	0	-5	6	2	8	2
28.	Hinton	190.00	17.00	9.50	12.00	21.00	-6	-10	8	0	20	12
30.	Horseshoe Canyon	643.00	109.00	20.25	46.75	0.00	-1	-10	24	0	5	0
31.	Kimiwan-McLennan	128.00	9.50	16.00	4.00	150.00	-16	-24	16	6	15	10
32.	Kneehill Valley	65.00	16.00	1.75	6.50	0.00	-4	-14	20	0	40	2
33.	Lac La Biche	815.00	34.50	35.50	22.00	37.75	0	-3	35	25	15	10
34.	Lacombe	0.00	4.00	0.00	2.00	12.00	-2	-12	5	0	12	4
35.	Lethbridge	487.00	74.00	24.00	40.00	3.00	-2	-20	20	0	1	0
36.	Medicine Hat	454.00	51.00	21.50	33.00	12.50	-1	-10	8	0	1	0
37.	Olds	0.00	0.00	0.00	0.00	6.50	-4	-14	30	0	40	2
38.	Penhold	80.00	2.00	4.00	1.00	3.50	0	-5	2	0	12	2
39.	Pine Lake	5.00	0.00	1.00	0.00	6.00	15	0	0	0	10	2
40.	Ponoka	300.00	10.00	10.00	20.00	54.00	-2	-10	10	0	8	4
41.	Rainbow Lake	100.00	3.00	7.00	3.00	42.00	- 14	-20	20	10	30	30
42.	Red Deer	178.00	61.00	5.25	16.50	45.75	5	-10	10	5	30	4
43.	Rimbey	0.00	10.00	0.00	7.00	17.50	0	-5	10	5	10	2
44.	Rocky Mountain House											
45.	St. Albert	531.00	94.00	24.00	46.00	48.00	-8	-15	2	0	5	2
46.	St. Paul	345.00	17.00	24.00	8.00	0.00	-5	-10	5	0	5	3
47.	Sheep River	558.50	81.50	40.50	30.25	8.50	-1	-15				
48.	Snake's Head	1014.50	126.00	42.25	64.25	32.25	-1	-6				
49.	Stettler	311.00	15.50	15.00	8.50	26.00	-2	-7	0	0	8	7
50.	Sylvan Lake	8.00	11.00	0.50	3.00	29.50	4	-10	10	6	15	4
51.	Tofield	350.00	6.50	15.50	3.50	5.00	-8	-14	0	0	25	5
52.	Trapline	185.00	0.00	4.00	0.00	0.00	8	8	17	15	10	0
53.	Vermilion	351.00	20.00	37.50	2.50	6.00	0	-8	20	5	10	2
54.	Wabamun Lake	812.00	92.00	35.50	49.00	21.50	-10	-21	10	0	30	15
55.	Waterton Lakes	135.00	37.00	15.00	32.50	3.00	-3	-6	80	22	30	0
56.	Wembley	283.00	2.00	5.50	1.50	2.00	3	4	30	5	7	0
57.	Wildlife Reserve	880.00	182.00	41.25	91.00	17.00	0	-12	8	0	30	5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Medicine Hat
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Count Locations

Author's Address:
152 Oakside Circle SW, Calgary, Alberta T2V 4H2.

Addendum to the 1993 May Species Count - Plants in Flower

J. Derek Johnson

One report of plants in flower from the 1993 May Count got lost in the paper shuffle. Margaret Clarke submitted a list of 35 species in flower from the south-facing slopes of Nose Hill in Calgary as follows:

Amelanchier alnifolia (Saskatoon)
Anemone multifida (Cut-leaved Anemone)
Antennaria aprica (Low Pussytoes)
  A. parvifolia (Small-leaved Pussytoes)
Astragalus crassicarpus (Ground Plum)
  A. dasyglottis (Purple Milk Vetch)
Campanula rotundifolia (Harebell)
Cerastium arvense (Field Chickweed)
Comandra umbellata (Bastard Toadflax)
Crataegus rotundifolia (Round-leaved Hawthorn)
Dodecatheon pulchellum (Saline Shooting-star)
Elaeagnus commutata (Wolf Willow)
Fragaria virginiana (Common Wild Strawberry)
Geranium viscosissimum (Sticky Purple Geranium)
Geum triflorum (Three-flowered Avens)
Hedysarum alpinum (American Sweet Vetch)
  H. boreale (Northern Sweet Vetch)
Lathyrus ochroleucus (Yellow Peavine)
Linum lewisii (Wild Blue Flax)
Lithospermum incisum (Narrow-leaved Puccoon)
  L. ruderale (Woolly Gromwell)
Lomatium macrocarpum (Long-fruited Wild Parsley)
Oxytropis sericea (Early Yellow Locoweed)
Penstemon nitidus (Smooth Blue Beard-tongue)
Potentilla concinna (Early Cinquefoil)
  P. fruticosa (Shrubby Cinquefoil)
Prunus virginiana (Choke Cherry)
Ranunculus acris (Tall Buttercup)
Senecio canus (Prairie Groundsel)
Smilacina stellata (Star-flowered Solomon's-seal)
Thermopsis rhombilfolia (Golden Bean)
Vicia americana (American Vetch)
Viola adunca (Early Blue Violet)
  V. canadensis (Western Canada Violet)
Zizia aptera (Heart-leaved Alexanders)

The report of harebell in flower is unusual and I would have discounted it were it not for the fact that it was also reported in flower from two other areas (Bow Corridor and Grande Prairie). This report does not change the total number of species seen in flower in 1993 (485), but it raises the number of participants to 229 and the total number of species seen in the Calgary area to 94.

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T6H 3S5.

Campanula rotundifolia (Harebell) Photo: J. D. Johnson

Alberta Bird Checklist Program

Major bird checklist programs have been initiated across North America. In Quebec a program was begun in 1948 and since 1982 over 10,000 checklists per year have been submitted. Wisconsin, which began its program in 1982, has over 6,000 checklists submitted by birders every year. The Migration Monitoring Council is reviewing data from various checklist programs and will be recommending a North American standard for checklist programs. The coordinator for this program is Greg Butcher, the Executive Director of the American Birding Association.

In a recent article in *Winging It,* the value of the information obtained from checklists is discussed. Two major values to a checklist program are identified:

1. To verify trends suggested by Breeding Bird Surveys (BBS) and Christmas Bird Counts (CBC), and
2. To determine trends for species that are not well covered by either the BBS or the CBC.

In Quebec, the EPOQ (Etude des populations d'oiseaux du Quebec, or Studies on Bird Populations in Quebec) is a database containing 2.2 million records of observations recorded on 158,000 checklists. Andre Cyr and Jacques Larvee in their article, "A Checklist Approach for Monitoring Neotropical Migrant Birds: Twenty-year Trends in Birds of Quebec Using EPOQ", state that using a checklist approach to census birds by volunteers allows the gathering of information on all species of any area, or any season, whether the bird is common or uncommon, or even only localized. They conclude that for a census program to be successful, information on all species in all habitats and seasons should be sought, because some seasons yield special information on many birds that might not otherwise be determined. Further, the huge amount of data gathered smooths out biases related to the less standardized methods of a checklist program and the large sample sizes bring further confidence in values of trends for many species not dealt with by BBS.

In their description of the Wisconsin Checklist Project, Stanley Temple and John Cary state that checklists have traditionally provided information on geographic ranges and seasonal occurrences of migrants and only recently have checklists been used to monitor temporal and spatial variation in the abundance of birds. They concluded that a checklist project is readily accepted by volunteers and produces interpretable data reflecting seasonal, geographic and year-to-year variations in bird populations. After five years, the Wisconsin project produced a book that presented many of the results of the project in a format that proved to be useful and appealing to bird watchers, and demonstrated to volunteers that their efforts were worthwhile.

The Federation of Alberta Naturalists has initiated a province-wide bird checklist program for 1994. With the assistance of the Provincial Museum of Alberta, Alberta Fish and Wildlife Division and the Canadian Wildlife Service a draft checklist was prepared for this year. A limited number of checklists were printed and circulated to individuals and organizations across the province. Not only were birders asked to fill them in and return them, but also to evaluate the form for content and ease of use. The results will be assessed later this year and a final format will be designed for mass publication and distribution in 1995. Also, the computer software used in the Quebec checklist program will be evaluated to ascertain whether it can provide the system necessary to report back to the volunteer birders. More detailed information will be provided on the data entry and reporting systems that will be adopted to manage the Alberta Checklist Program.

* *

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Supplement Number 9 Alberta Naturalist Volume 24, Number 3

1993 May Species Count for Birds and Mammals

Recent Articles on the Natural History of Alberta

Plant List - Prospect Creek and Cardinal Divide

Blue Jay Photo: Edgar T. Jones

1993 May Species Count for Birds and Mammals: The Birds

Curtis Pollock

It's finally out, and it was definitely worth waiting for! The final tally from the 1993 May bird survey by the Federation of Alberta Naturalists shows that it was another record-breaking year, smashing previous highs established in the 1991 and 1992 counts.

The number of individual counts increased to at least 18 (one of the most difficult aspects of the entire compilation of results was determining the most fitting and fair way of splitting/amalgamating counts) from the record of 17 in 1992. Six new counts are included in this 1993 total (Buffalo Lake, Athabasca, Footner Lake/High Level, Boreal Research Station/Fort Vermilion, Saskatchewan River Crossing and Bow Corridor/Sibbald), plus Fort McMurray is back on the charts after an absence of several years. Not reporting in 1993 were Suffield, Coyote Lake, Glenevis, Elk Island and Lac la Biche, all of which were included in the 1992 survey. The Calgary count was reported in *Pica* and is appended to this survey.

The number of observers was 251 province-wide, up from the 239 reported in 1992, but down from the record set in 1991 (variously reported as both 272 and 302 observers).

The big news, though, was in the number of bird species tallied, with a new provincial single-year record of 263! The previous record was 258, set in 1991, while in 1992 the number of species recorded slipped to 252. Included in this record number of species are at least two, and possibly three, that are first-ever records in the 18 year history of the May count in Alberta: American Black Duck, Willow Ptarmigan and Northern Shrike. (There is no apparent evidence that any of these three species has been recorded on an earlier count, although further research will be needed to determine this more precisely, as the overall figures indicate a net gain of only two species.)

With the above additions the cumulative total over the 18 year span of the provincial May count --the May count "lifelist"-- has definitely climbed over the 300 mark for the first time! From the incomplete records available when the 1993 results were being compiled, it would appear that this all-time list (which reached a total of 299 in 1991 and was unchanged the following year) is now at 301 species!

Species seen on count day for the first time in the 1990s included Red Phalarope, Boreal Owl and Blackburnian Warbler (these three species for only the second time ever on a May count), Western Bluebird, Northern Mockingbird, Palm Warbler, Rosy Finch and Cassin's Finch. Talk about achievements and notable records!

Count Highlights

Lethbridge: The count day tally of 146 represented a new record high for this count, well above the long-term mean of 123 species. For the first time ever, Black-throated Green Warbler and Chukar were recorded; the latter, however, was presumed to have originated from the more then 600 Chukars released over the last 3 years in the Lethbridge area by the local Fish and Game Association and was not countable - not yet! Generally accepted guidelines for birding are that a species that has been released into the wild in any new area cannot be counted as a fully "valid" species for seven years after the first release.

Other species of interest on this count were a Garganey, seen only a few miles from the place where one was observed in 1990, as well as five Red-necked Phalaropes, one Hermit Thrush and seventy-seven Lark Buntings!

Waterton: A new record high number of species (105) was set on this count, well above the long-term mean of 92 species. Eastern Phoebe, Marsh Wren, Hooded Merganser and Le Conte's Sparrow were recorded for the first time. Other species of interest on this count were a pair of nesting Trumpeter Swans (later observed to have five cygnets), a Sandhill Crane, five Vaux's Swifts over the townsite, and Three-toed and Pileated Woodpeckers.

Cardston: Each year since 1987, new high records have been established on this count. 1993 was no exception as a new high of 112 species was recorded! First-time species were Osprey, Sandhill Crane, Lewis's Woodpecker, Rock Wren, American Tree Sparrow, Lark Bunting and White-throated Sparrow. Other observations of note included a remarkable 24 Ferruginous Hawks, 7 Say's Phoebes and 2 Bobolinks.

Claresholm: The 122 species noted on this count represents a new record and is well over the previous high mark of 116 species set last year. For the first time, Pileated Woodpecker and Gray-cheeked Thrush were seen. Other species of interest included a single Wild Turkey, Long-eared Owl and Le Conte's Sparrow.

Medicine Hat: Acording to coordinator Dennis Baresco, participation was down considerably for this count, resulting in a low overall count figure. Though the weather was cool and cloudy, it was nonetheless a fine day for birding. Two species new to this count were spotted: four American Black Ducks (one of four provincial first recorded in 1993), and an Eastern Phoebe. The Black Ducks were seen by Ben Velner, an experienced birder. They were on the river at a secluded island site. He described them as Mallard-sized, with a very dark body and lighter coloured head. They showed no visible white as they sat in the water or flew away from him.

Other highlights included the first Northern Mockingbird recorded on this count since 1985; also recorded for only the second time on count day were Turkey Vulture, Osprey and Mountain Bluebird. Wilson's Phalarope and Warbling Vireo were way down; Least Flycatcher and Tree Swallow were way up; and Lark Bunting continued its meteoric rise.

Bindloss: This count produced the province's only Yellow-breasted Chat in 1993, and also found Burrowing Owls and a juvenile Long-eared Owl.

Bow Corridor/Sibbald: Thirty-two observers in 10 groups recorded 84 species throughout the Bow Corridor area including Bow Valley Provincial Park, Grotton Canyon, Gap and Barrier Lakes, Sibbald Flats, the Seebe and Exshaw townsites and Sibbald (the last by a one-man team surveying independently).

This count turned up the province's only Snow Geese (2), Wood Ducks (6) and Bohemian Waxwings, as well as 15 Ospreys and good numbers of all three regularly-occurring Alberta species of hummingbirds.

Two observers recorded a nest-building pair of Red-necked Grebes, "uttering their cacophony of cackling and wailing (made only during nest-building)," as described by compiler Janet E. Rodgers.

Participants awarded their annual "Birdbrain Award" to a female Mountain Bluebird spotted at Seebe Meadows which spent hours gleefully preening herself, flitting around, singing and flirting ... to her own image, reflected in the sideview mirror of a parked car!

Banff/Canmore: Covering Banff, Canmore, Wind Ridge and Lake Louise, this group of 13 observers recorded 98 species including 21 (!) Harlequin Ducks (one of only two counts province-wide recording this species) and a pair of Willow Ptarmigan, a provincial first on a May count. Other highlights were 13 Solitary Sandpipers, a Lewis's Woodpecker three species of chickadees. The participants shared with the neighboring Saskatchewan River Crossing count the distinction of having the first May count record of Rosy Finches in the 1990s.

Yamnuska: It was "pouring rain all day", but this group managed to record 53 species anyway.

Saskatchewan River Crossing: This first-time count, shortened by inclement weather, and reduced to a one-man effort by compiler Douglas Leighton, contributed the first Western Bluebirds on a May count in this decade and, with the nearby Banff-Canmore count, shared the same distinction in regard to Rosy Finches. Leighton also recorded the province's only Red Crossbills and American Pipits in 1993, plus a pair of Lewis's Woodpeckers which "behaved like a courting pair ready to nest", and a singing Northern Mockingbird!

Red Deer: Participants in this count put up some big numbers for certain species (e.g., 523 Eared Grebes, 111 Ruddy Ducks, 581 Coots, 717 Black Terns) with a total of 123 species. Highlights included two Great Gray Owls (one of three counts in the province each recording two Great Grays) and a "Harlan's" Red-tailed Hawk.

Buffalo Lake: This count turned up a good mix of those species to be expected in central Alberta, including 67 lingering Black-bellied Plover, a large number of Cliff Swallows (1,092) and 24 Northern Orioles.

Beaverhill Lake/Elk Island: This count, as usual, recorded numerous species not found elsewhere in tallies around the province. Included were Greater White-fronted Goose, Peregrine Falcon, Semipalmated Plover, Ruddy Turnstone, Red Knot, Baird's Sandpiper, Buff-breasted Sandpiper, Palm Warbler (first time in the 1990s) and Canada Warbler, all in the Beaverhill Lake area counts, plus Great Crested Flycatcher and Yellow Rail on the Elk Island/Lamont surveys. As usual, some very high numbers of shorebirds were recorded including an incredible 1,060 Red Knots, 1,259 Black-bellied Plovers and 4,025 Red-necked Phalaropes.

Athabasca: This count recorded Mourning Warbler as well as Connecticut Warbler (one of two counts noting these two species), and four species of vireo.

Wembley/Grande Prairie: The trio who conducted this count recorded the second ever sighting of Red Phalarope on a May count, a pair seen at Uswells Lake. They also had the province's only 1993 records of Mew Gull, Eurasian Wigeon and Northern Saw-whet Owl. Other noteworthy species recorded were Trumpeter Swan, Barred Owl and Great Gray Owl.

Fort McMurray: This new group, which took over a count that had been inactive for several years, contributed one of only two records province-wide for Black-and-white Warbler and for Rusty Blackbird, and one of only three for Black-throated Green Warbler and Fox Sparrow. Another highlight was finding nesting Boreal Chickadees.

Fort Vermilion: This new count was conducted by the staff of the Boreal Research Station, which is located on the Peace River about 20 km southeast of Fort Vermilion. The focal point of their biological biodiversity research is "old growth boreal covers" which are stands of largely coniferous trees located in river valleys passed over by the cycles of fire in the forest.

As might be expected, the volunteers turned up a diversity of boreal-nesting birds including four species of vireos and thirteen species of warblers. They also had one of two tallies of Rusty Blackbird province-wide. The group had the only sighting of White-rumped Sandpiper, Short-billed Dowitcher and Blackburnian Warbler on the 1993 count -- the Blackburnian record being only the second ever on an Alberta count. But, the most outstanding mark of this survey was certainly the recording of Glaucous Gull, the first ever on an Alberta May count, and a highlight at any time!

Footner Lake/High Level: A first-ever count, this survey tallied 83 species in the boreal forest area near High Level. The tally included the second record of Boreal Owl in 18 years of May species counts in the province and what is apparently the first Northern Shrike ever! This count also contributed the province's only 1993 records for Surf Scoter, Black-backed Woodpecker and Sharp-tailed Sparrow.

Count Details:

Participants, areas covered, team hours, distance and weather, if given

Lethbridge: May 29-30. Compiler: Teresa Dolman, 37 Carleton Road W., Lethbridge, Alberta T1K 3X4. Participants: Dale and Paul Baumback, Lloyd and Bruce Bennett, David Bly, Teresa Dolman, Doug Dolman, Maria Geppert, Witold and Andrew Gierulski, Connie Goodall, Victor Hafichuk, Betty Haig, Bob Hall, Harold and Olga Hughes, George and Betty Luco, Gordon Ross, Katharine and Frank Russell, Mary Thomson, Doug Walker, Joy, Jessica and Paul Wilkinson.
Areas covered: Six-mile Coulee, Sugarbowl Coulee, Henderson Lake Park, Popson Park, Alexander Wilderness Park, Pavan Park, Liz Hall Wetlands, Botterill Park, Keho Lake, Coaldale (town and reservoir), Park Lake and Taber Provincial Parks, Taber, Chin, Fincastle and Horsefly Reservoirs, Lost Lake, Purple Springs Sandhills, Taber, Moon River Estates, Ft. MacLeod River Park, McNally Road to Roxburn, Rollingson and Luco River Bottoms, Stirling Lake, Tyrrell Lake, St. Mary and Oldman River junction, Pothole Creek area, Russell Ranch.
Team hours: By vehicle, 39.5 hours; by foot, 54.5 hours.
Team distance: By vehicle, 968 km; by foot, 69 km.
Weather: May 29: 10-21C, wind ESE 5-48 km/hr., 0.4 mm precip. May 30: 07-18C, wind NNW 0-37 km/hr, no precip.

Waterton: June 5-6. Compiler: Teresa Dolman, 37 Carleton Road W., Lethbridge, Alberta T1K 3X4. Participants: Dale and Paul Baumback, Fay Clawson, Doug Dolman, Teresa Dolman, Martin Gebauer, Witold Gierulski, Bill and Jessie McKay, Gordon and Hazel Ross, Shirley Sillito and Doug Walker.
Areas Covered: Road from town to entrance, Belly River road, buffalo paddocks and meadows east of paddock, Bertha Lake trail, Red Rock road to Coppermine Creek, townsite, Cameron Lake road.
Team hours: By vehicle, 14, by foot, 33.
Team distance: By vehicle, 180 km; by foot, 34 km.
Weather: June 5: 03-18C, wind S 5-30 km/hr., no precip. June 6: 05-18C, wind S 5-30 km/hr., no precip.

Cardston: May 29-30. Compiler: Shirley Sillito, Box 1102, Cardston, Alberta T0K 0K0. Participants: Fay Clawson, LeRoy Scotter, George and Etta Scotter, Wendel Shaw, Jeff Shaw, Shirley Sillito, Barbara and Lynn Sommerfeldt, Tom Ulrich and Jon Wassink.
Areas covered: Cardston, Woolford Park, Jefferson, Whiskey Gap, Kimball, Glenwood, Hillspring, Police Outpost Provincial Park.
Team hours: By vehicle, 56; by foot, 38.
Team distance: By vehicle, 352 km; by foot, 25 km .
Weather: May 29: 02-17C, wind SSW 5-15 km/hr., May 30: 11-15C, wind NNW 5-35 km/hr.

Claresholm: May 29-30. Compiler: Grace Norgard, Box 10, Claresholm, Alberta T0L 0T0. Participants: Jason and Ruth Atwell, Hazel Hudson, Grace Norgard and Ruth Radway.
Areas covered: 40km radius of Claresholm.
Team hours: By vehicle, 35; by foot, 6.
Team distance: By vehicle, 579 km; by foot, 10 km.
Weather: May 29: 20C, wind NE 0-20 km/hr., trace of rain. May 30: 21C, wind NE 5-20 km/hr.

Medicine Hat: May 30. Compiler: Dennis Baresco, 266 - Street SE, Medicine Hat, Alberta T1A 1J6. Participants: Dennis Baresco, Barb Chisolm, Ron Chisolm, Bob Frew, Corlaine Gardner, Rob Gardner, Phil Horch, Mike Horvath, Hope Johnson, Lex Karne, Sandra Korbelik, Carolyn Kury, Phyllis MacDonald, Jim Marshall, Lorine Marshall, Garry Newton, Dorothy Robertson, Gretton Swan, Veronica Swan, Evelyn Tate, Bill Tidy, Ruth Tidy, Ben Velner and Michael Velner.
Areas covered: Medicine Hat and area including Police Point, Empress, Marlborough, McKinley Ranch.
Team hours: By car, 15.5; on foot 44.5.
Team distance: By car, 235 km; on foot, 66 km.
Weather: Cloudy and cool (14C to 10C); wind 15-30 km/hr., light precip.

Bindloss: May 30. Compiler: Michael O'Shea, Box 38, Bindloss, Alberta T0J 0H0. Participants: Kevin

Fizsimmons, Dorothy Hill, Cori Lausen, Danielle O'Grady, Michael O'Shea, Ania Wojciechowski, Glen Trafford.
Area covered: 12 km radius of Bindloss.
Team hours: 8 (7:30 a.m. to 8 p.m.).
Team distance: By car, 50 km; on foot, 4 km.
Weather: Heavy rains evening before and during early morning, sunny in afternoon, but muddy conditions made some areas difficult to get to.

Bow Corridor/Sibbald: May 29-30. Compiler: Janet E. Rodgers, Box 153, Exshaw, Alberta T0L 2C0, 673-2351. Participants: Heather Ashley, Kate Billingham, Janet and Michael Brygger, Bob and Ruth Camenzind, Mrs. R. Cummings, Linda Davis, Pat Donald, Marilyn Dyck, Larry Dzoliba, Jill Keiter, Dick and Miki Mann, Donna Mackay, Kirstin Olson, Roy and Bentre Preshaw, Rosie and Shane Reid, Janet E. Rodgers, Paula Rodriguez, Wayne, Diane, Chelcy and Mandy Scott, Lee Sproule, Emily and Paul Smith, Myra Wiege, Eva Zidek.
Areas covered: Land and bodies of water from Old Camp (east of Canmore) to Nakoda Lodge (14 km east of Exshaw) on Hector Lake, and over to Barrier Lake, including Bow River, Gap Lake, Grotto Canyon, Jura Creek, Lac Des Arcs, Bow Valley Provincial Park, Exshaw and Seebe townsites, Sibbald Flats.
Weather: Rain all day Saturday, dry and sunny all Sunday.

Banff/Canmore: May 30. Compilers: Diane and Mike McIvor, BVN, Box 1693, Banff, Alberta T0L 0C0. Participants: Bruce Bembridge, Heather Dempsey, Jean Greig, Joel Hagen, Toni Hess, Deb Hornsby, Diane and Mike McIvor, Donna McKeown, Mike Potter, Bob Smith, Gareth Thompson, Keith Webb.
Areas covered: Banff-Canmore, Wind Ridge, Lake Louise.
Weather: Clear and warm.

Yamnuska: May 29. Compilers: Diane and Mike McIvor, BVN, Box 1693, Banff, Alberta T0L 0C0. Participants: Moragh Dornian, Patricia Grayling, Jean Greig, Deb Hornsby, Diane and Mike McIvor, Bob and Mary Smith.
Weather: Pouring rain all day!

Saskatchewan River Crossing: May 30-31. Compiler/Observer: Doug Leighton, Box 25, Banff, Alberta T0L 0C0.
Areas covered: Kootenai Plains Natural Area, Abraham Lake, Columbia Icefields, Bow Summit.
Team hours: 20.5.
Team distance: By vehicle, 396 km; by foot, 9 km.
Weather: "I had a clear afternoon and morning at the Kootenai Plains Natural Area and Abraham Lake, but the mountains were wet.. I was rained out at the Columbia Icefields but got some alpine coverage at Bow Summit."

Red Deer: Compiler: Myrna Pearman, c/o Red Deer River Naturalists, Box 785, Red Deer, Alberta T4N 5H2. Areas and Participants: Benalto: Ken and Linda Larsen, Michelle and Laura Larsen; Burnstick Lake: Bill and Cindy Post, Doug Taylor, Lloyd and Beth Cumming, Gerry and Peggy Kadey; Kneehill Valley: Dorothy Dickson; Penhold, Helen Harris, Stewart and Eileen Ford; Raven, Carol and Grant Kelly; Red Deer: Beth Peck, Dorothy Hazlett, Jason Rogers, Keith Kline, Kerry, Marjorie, Rondo Wood: Minnie Cunningham, Sally and Ken Morton, Tom Pierce, Germaine Maga; and Sylvan Lake: Myrna Pearman and Jeffrey Eadie.
Team hours: By car, 37.5; by foot, 72.25; by boat, 22.
Team distance: By car, 185.5 km; by foot, 108.5 km; by boat, 10 km.

Buffalo Lake: May 29-30. Compilers: Lloyd Lohr and Carol Simpson. Participants: Charles Bird, Bertha Clarke, Trudie Graft, Gladys and Wilf Hewlett, Martha and Ron Kruger, Agnes and Rolf Lehmann, Lloyd Lohr, George and Grace Neill, Carol Simpson, Davis and Les Simpson, Barb and Garnet Stark.
Team hours: By car 20; by foot, 8.
Team distance: By car 274 km; by foot, 9 km.
Weather: May 29, +5 to 12C, high clouds; light rain in the afternoon; SE breeze 7-8 km/hr.; May 30, -1C to +18C, sunny.

Beaverhill Lake/Elk Island: May 29-30. Compiler: Roy Fairweather, R.R. #2, Tofield, Alberta T0B 4J0. Participants: Des Bovell, Bob Carroll, Pat Crossley, Roy Fairweather, Jim Henry, Geoff Holroyd, Michael Holroyd, Brian Hornby, Edgar T. Jones, Jeanne Jones, Gerry McKeating, Don Mitchell, Sandra Overguard, James Tasker.
Areas covered: Beaverhill Lake and surrounding areas within an 80 km radius, including Hwy. 16 west to Edmonton, Elk Island National Park, Whitford Creek, and Lamont area.

Athabasca: May 29. Compiler: Jim Lange. Participants: Ann and Garth Edwards, Jim Lange, Blair, Geoff, Kyle, Lindsay, Merilyn and Ran Peruniak, Ann Stiles and Courtney, Luke, Sheena and Riley Taggart.
Areas covered: ForFar Park (about 29 km SW of Athabasca), Flat Lake, Canoe Lake, Hop Lake, Jackfish Lake (about the same distance SE of Athabasca), and numerous small ponds east of Meanook.
Team hours: By car, 5; by foot, 6.5.
Team distance: By car, 176 km; by foot, 3 km.
Weather a.m.: +3C, sunny, light winds SSE 15 km/hr,

becoming partly cloudy with sunny breaks; **Weather p.m.:** +25C, partly cloudy with sunny periods, light winds.

Wembley/Grande Prairie: May 29-30. Compiler: Ellen Craig, R.R. #1, Wembley, Alberta T0H 3S0. Participants: Gavin and Ellen Craig, Lucy Dahl.
Areas covered: Township 65 W6 trapline and road to it (near Grande Prairie), NW 5-72-7 W 6 (near Wembley), and from there to Hermit Lake, Bear Lake, Lake Saskatoon and Uswells Lake.
Team hours: By car, 12; by foot 1.5.
Team distance: By car, 258 km; by foot, 2 km.
Weather: 23C and sunny both days, with light easterly winds.

Fort McMurray: Compiler: Fred Korbut, 5409 - 15 Saunderson Avenue, Ft. McMurray, Alberta T9H 3Z5). Participants: Wendy Burry, Louise Esch, Dan Gordon, Grant Henry, Fred Korbut, Maxine Wiseman.
Weather: Variably sunny and cloudy, +10C.

Fort Vermilion: May 29-30. Compiler: Jim Butler, Department of Forest Science, University of Alberta, Edmonton T6G 2H1. Participants: Andy Miller, Chris Fisher, D. Lisa Takats, Robert Lindsay, Jeff Jarrett.
Areas covered: Boreal forest, parkland, cultivated fields, and various wetland habitats around the Boreal Research Station, which is located on the Peace River about 20 km SE of Fort Vermilion in a small parkland isolate surrounded by boreal forest. Boreal stands surveyed included varying aged coniferous and deciduous forest, within and adjacent to the Peace River Valley.
Team hours/distance: 45 observer-hours, 200 km driven, 20 km walked.

Footner Lake/High Level: May 28-31. Compiler: Karen Herrman. Participants: Jason, Kate, Stuart, Roger, Jackie, John, Tony, Katrina, Steve, Scot, Ian, Cindy, Eileen, Ken, Karen, Henri, Steve, Therese, Joanne, Tracy, J.P., Kelly and Mike.
Areas covered: In and around the Footner Lake Forest including Rainbow Lake and districts around High Level and Fort Vermilion.

* *

FAN's May Species Count is held on the last weekend in May.

Send your May Species Count for Birds and Mammals data to: Curtis Pollock
Wolf Road, Box 776,
100 Mile House, B.C.
V0K 2E0.

The deadline for FAN project reports is July 15th.

1993 MAY SPECIES COUNT - BIRDS

Species	Leth	Wat	Card	Clar	Med	Bind	Bow	Banf	Yam	Sask	Red	Buff	Bea	Elkl	Atha	Wem	FTMc	FtVe	Foot
Common Loon	4	4	2				12	2	2	2	13			16	9	2	2	1	6
Pied-billed Grebe	9		1		5						9		3	6		5			
Horned Grebe	2		5	5							102	38	15	26				6	
Red-necked Grebe	12		37				9	1			133	4	8	98	51	3	4		6
Eared Grebe	357		16	152	7	2					523	11	454	285		480	4	279	
Western Grebe	50		4					1			27		31	51		7			
American White Pelican	361		4		46								257	153					
Double-crested Cormorant	142		23		4							9	68	169					
American Bittern	2	1	1					1			2		4	9			1		
Great Blue Heron	19	3	1	9	45		1				24	2	8	32	2	1			
Black-crowned Night Heron	18												11	35					9
Trumpeter Swan		5	5													5			
Great White-fronted Goose													1	1					
Snow Goose							2												
Canada Goose	1077	17	373	659	692	27	339	81		15	515	304	241	423	2	194	18	56	9
Wood Duck							6												
Green-winged Teal	13		4	8	4	1		5	2	4	9	15	87	117	4	10	10	21	10
American Black Duck					4														
Mallard	202	29	154	401	131	3	64	137	8	19	86	172	215	500	65	152	25	84	24
Northern Pintail	83	2	54	78	25	4					1	24	34	86		6	1	24	7
Garganey	1																		
Blue-winged Teal	156	3	48	184	90	14	14	9	5	4	89	111	147	239	4	75	24	35	2
Cinnamon Teal	36	2	28	28	4				2		12	2	13	10		3			
Northern Shoveler	92		79	99	43	2					59	70	223	341	1	27	12	110	2
Gadwall	60		8	71	26	4					49	118	143	222		59		18	1
Eurasian Wigeon																2			
American Wigeon	56	4	9	4	26	2					21	28	26	14	5	36	6	52	1
Canvasback	63		25	16	14	2					33	21	112	161	12	22		6	1
Redhead	58		9	28	4	8					76	79	103	114		25		21	
Ring-necked Duck	13	16	5	14	8		5	7	12		54		14	31	13	3		24	53
Greater Scaup													1	1					1
Lesser Scaup	259		87	184	33	10+			4	34	232	88	338	543	10	617	4	165	1
Harlequin Duck		2						21											
Surf Scoter																			1
White-winged Scoter	5		8								29		9	22		144			4
Common Goldeneye	6		2		4		2				41	16	34	114	3		10	17	
Barrow's Goldeneye		7	12				34	4	4	6	26			165		40			3
Bufflehead	98	4	2	3		4	7	5	13	1	112	20	62	148	57	52	12	27	53
Hooded Merganser		1					4												
Common Merganser	9	11	12	2	19		9	8		4	1			3		2			
Ruddy Duck	83		26	110	18	30					111	50	112	211	30	76	8	16	4
Turkey Vulture					3														
sprey	1	3	1		1		15	4			4					1			
ald Eagle							4	4			2					2		2	
orthern Harrier	39		28	33	6	3					3	7	15	14	1	2		3	1
harp-shinned Hawk		1			2					1			2	3		1			1
ooper's Hawk		1											2	3					
orthern Groshawk																1			2
road-winged Hawk														2		1		1	
wainson's Hawk	40		62	56	24	3					7	6	22	22		1			
ed-tailed Hawk * "Harlan's"	22	4	15	39	7		4	1			*26	39	52	58	2	4		3	2
erruginous Hawk	10		24	6	4	1													
olden Eagle	3	2	7	2	1	1		1										1	
merican Kestrel	15	1	1	8	12	5	2	1	1	3	7	1	4	4	8	4	2		5
erlin	5	2	1	6	1	1		1		3		3	3	5					
eregrine Falcon													1	1					
rairie Falcon	4		5	1	2														

1993 MAY SPECIES COUNT - BIRDS

Species	Leth	Wat	Card	Clar	Med	Bind	Bow	Banf	Yam	Sask	Red	Buff	Bea	Elki	Atha	Wem	FTMc	FtVe	Foo
Gray Partridge	30		3	11	6	4							6	5	1	2			
Chukar	1																		
Ring-necked Pheasant	16		3	7	20	2										2			
Spruce Grouse				1			1			1									
Willow Ptarmigan								2											
Ruffed Grouse		4	7				4	4		3	9		3	7		5			
Sharp-tailed Grouse					1								2	2					
Wild Turkey				1															
Yellow Rail														1					
Sora	20	4	5	3	2	10		2		1	26	2	27	33		2	1	1	
American Coot	143		65	42	18	2			5		581	60	60	88	50	50	2	139	
Sandhill Crane		1	2								2		2	2				1	
Black-bellied Plover	113			4								67	1259	1259					
Lesser Golden Plover	2												13	13	18			22	
Semipalmated Plover													2	37					
Piping Plover	2																		
Killdeer	74	5	64	41	30	17	8	9		2	20	16	121	145	3	8	6	4	
American Avocet	88		8	57	8	27					2	11	66	89					
Great Yellowlegs							1	1		1			2	2			6		
Lesser Yellowlegs				4							8	1	1	37	1	2	8	13	
Solitary Sandpiper	2						3	13	1		3			3		1		2	
Willet	38	1	3	20	10	11						2	30	39					
Spotted Sandpiper	46	11	21	11	12	1	24	15	6	11	48	2	7	14	5	4		40	
Upland Sandpiper	2			1															
Long-billed Curlew	22		11	10	10	17													
Marbled Godwit	36		8	27	23	19						4	74	122	3				
Ruddy Turnstone				1									5	5					
Red Knot													1060	1060					
Sanderling	10												204	210					
Semipalmated Sandpiper	1				2								627	484				12	
Least Sandpiper				5										26					
White-rumped Sandpiper																		2	
Baird's Sandpiper													5	26					
Pectoral Sandpiper				1										17				4	
Stilt Sandpiper													130	37				7	
Buff-breasted Sandpiper													10	10					
Short-billed Dowitcher																		4	
Long-billed Dowitcher																		4	
Common Snipe	6	5	22	8	10	1		12	2	8	24	10	32	49	3	2		2	
Wilson's Phalarope	94		33	48	3	40					8	2	238	357		2	2	10	
Red-necked Phalarope	5												4025	4042					
Red Phalarope																2			
Franklin's Gull	1108			142	283	2					91	17	68	96	16	108		12	
Bonaparte's Gull							1				18			7	11	2			
Mew Gull																2			
Ring-billed Gull	947	12	365	112	829			1		6	33	24	226	233		15	30		
California Gull	369			22	4		30				5	69	2	3		3		1	
Herring Gull													1	1		2		5	
Glaucous Gull																		1	
Caspian Tern	38																		
Common Tern	134		3		9						40	1	5	13				1	
Forster's Tern	8												3	24					
Black Tern	15		71	10	7	10					717	163	237	409	35	37	4	1050	
Rock Dove	154		66	89	432		8				47	39	25	73	12	1			
Mourning Dove	126		23	19	110	5		1			5	1		5					
Great Horned Owl	19		10	14	9	3					10		1	2		2			
Burrowing Owl	4			6	1	1													

1993 MAY SPECIES COUNT - BIRDS

Species	Leth	Wat	Card	Clar	Med	Bind	Bow	Banf	Yam	Sask	Red	Buff	Bea	Elkl	Atha	Wem	FTMc	FtVe	Foot
Barred Owl																1		2	
Great Gray Owl											2					2			2
Long-billed Owl				1		1													
Short-eared Owl	6		3	5	1								1	1					
Boreal Owl																			1
Northern Saw-whet Owl																2			
Common Nighthawk	5		2		1								1	3			1		5
Vaux's Swift		5																	
Ruby-throated Hummingbird				1			13				4	5	1	5					
Calliope Hummingbird		2					16		1	2									
Rufous Hummingbird		6		5			33	6		1									
Belted Kingfisher	6	2	1	4	1		11	6	1		1			4			6		
Lewis's Woodpecker			1					1		2									
Yellow-bellied Sapsucker				5							5	13		5	1	5		2	11
Red-naped Sapsucker		2	4	3		1		1	1										
Downy Woodpecker	8	2	1		7				1		10	4		2	1	2			1
Hairy Woodpecker	2	1			2		2			1	11	5		6		2	4	1	1
Three-toed Woodpecker		1								1								1	
Black-backed Woodpecker																			1
Northern Flicker	23	4	5		19	2	8	6	1	8	11	3	2	7	1	5	4	3	10
Pileated Woodpecker		1						2			5		1	4	1	2	1		3
Olive-sided Flycatcher	1	1		2				1	1		2			2		1			
Western Wood-Pewee	34	3	21		6	1	2	7	1	4	22		5	59	3	5			
Alder Flycatcher	2	4									5	1	17	19					
Willow Flycatcher	4	1						1											
Least Flycatcher	60	10	7		50	5	1	5	16	5	148	8	131	122	10	2	2	11	
Hammond's Flycatcher										1									
Dusky Flycatcher		3					1	2	2	10									
Eastern Phoebe	2	1			1						5	5	3	12	6	2		2	2
Say's Phoebe	8		7																
Great Crested Flycatcher														1					
Western Kingbird	107				65	4	1	1		1									
Eastern Kingbird	135	3	24		88	8			4	9	8	11	31	31	1	2		1	
Horned Lark	180		82		352	50							5	4					
Purple Martin											27	14	50	47					
Tree Swallow	28	26	56		91	3	44	115	4	8	178	178	183	245	6	18	12	4	6
Violet-green Swallow	4	6					19	67											
N. Rough-winged Swallow	24		26		9		11	7	3	4	1			8					
ank Swallow	119		16		47	2	59	40	1		52	48		71			6	3	2
liff Swallow	382	220	885		515		117	7		28	516	1092	173	151		200	6		11
arn Swallow	100	9	27		74	15	55	15		45	59	103	96	158	10	16	8	10	28
ray Jay		2					9	10		8	4				3	2	2	2	38
teller's Jay		3																	
lue Jay	1										12	9	1	7	1	4	2	1	
lark's Nutcracker								5		8									
ack-billed Magpie	133	10	62		194	7	33	54		2	31	56	50	75	16	15	6	4	8
merican Crow	81	17	29		57	8	34	40		6	83	113	60	149	11	8	6	1	1
ommon Raven	2	13	32				53	40	3	11	10		3	7	9	4	8	16	29
ack-capped Chickadee	15	4	1		13	1	14	12		1	90	9	2	7	2	2		2	1
ountain Chickadee		1					23	4		6									
oreal Chickadee								3		4	4						2	2	6
ed-breasted Nuthatch	2	4		2	2		9	10	2	8	8			6		1	1	3	1
hite-breasted Nuthatch		2					1				8			2	2				
own Creeper	1																		
ock Wren	23		2	1															
ouse Wren	129	16	48	104	102	8	2		1		61	42	30	37	3	2		1	
inter Wren		2				1												1	

1993 MAY SPECIES COUNT - BIRDS

Species	Leth	Wat	Card	Clar	Med	Bind	Bow	Banf	Yam	Sask	Red	Buff	Bea	Elkl	Atha	Wem	FTMc	FtVe	Foot
Marsh Wren	31	2				3					19	3	32	32				4	2
American Dipper		2					4	3											
Golden-crowned Kinglet		12						12		1	1							1	1
Ruby-crowned Kinglet	1	39		2	2		24	39	8	48	18			5				4	
Western Bluebird										2									
Mountain Bluebird	52	5	30	72	2		10	3	4	13	73	46	5	17	4				
Townsend's Solitaire	1	1		1				3		4									
Veery	2	3	1	1	9						1	1		4					
Gray-cheeked Thrush	2			1															
Swainson's Thrush	23	3	2	50	19	5	2	6	2	12	1		6	8	1			1	
Hermit Thrush	1						8	2	3	21				2		3		4	
American Robin	271	82	157	130	477	6	82	60	8	39	97	55	83	116	20	72	46	16	134
Varied Thrush	1	5					2	8		14									
Gray Catbird	29	4	6	10	18	2					5	6		3					
Northern Mockingbird					1					1									
Brown Thrasher	31		1	7	18	13													
American Pipit										6									
Sprague's Pipit	6				4	1							8	6		1			
Bohemian Waxwing							1												
Cedar Waxwing	27	26	9	23	31	3	10				5	2							
Northern Shrike																		3	
Loggerhead Shrike	3				5	7													
European Starling	376	16	143	167	1373	20	7	31		6	57	48	80	136	4	8	8	6	2
Solitary Vireo									1	2					1			1	
Warbling Vireo	13	24	1	3	9	3	4	15	4	14	10		30	38	1	2		1	
Philadelphia Vireo											7				1			2	
Red-eyed Vireo	1	1		4	4						10	2	5	5	2			20	
Tennessee Warbler						2		1	3				2	6		1		19	2
Orange-crowned Warbler		1					1	6	3	19				1				4	
Yellow Warbler	128	48	65	41	264	8	13	19	2		141	49	178	188	12	18	4	32	4
Magnolia Warbler								1					1	1				6	
Yellow-rumped Warbler	10	14		4			14	37	8	79	10		7	19	1	2	6	5	1
Townsends's Warbler		7		1			2	18		13									
Black-thr. Green Warbler	1																1	2	
Blackburnian Warbler																		1	
Palm Warbler													1	1					
Blackpoll Warbler				1	2			3		1			2	3		1		1	
Black-and-white Warbler	1													1			1	2	
American Redstart	3						3	2						4		5	8	8	
Ovenbird									2		2			13	5	4	1	9	2
Northern Water Thrush		5		2				7	7	1								2	
Connecticut Warbler														2	1				
Mourning Warbler														2	1				
MacGillivray's Warbler		9					1												
Common Yellowthroat	38	7	8	6	34	6	4	19	2	4	2	1	16	20				1	
Wilson's Warbler		7						6		14			1	1					
Canada Warbler													1	1					
Yellow-breasted Chat						1													
Western Tanager		7						1		2	4			1	1		1	5	
Rose-breasted Gosbeak						1	1				8			9	5	3		4	
Black-headed Grosbeak		3																	
Lazuli Bunting		4			1														
Rufous-sided Towhee	12				21	5						2							
American Tree Sparrow			8													3		1	
Chipping Sparrow	45	11	4	81	18	4	27	60	28	28	16	6	15	25	6	1	10	5	3
Clay-colored Sparrow	65	5	10	35	36	20		2	3	1	58	76	188	178		3	2	27	
Brewer's Sparrow	9																		

1993 MAY SPECIES COUNT - BIRDS

Species	Leth	Wat	Card	Clar	Med	Bind	Bow	Banf	Yam	Sask	Red	Buff	Bea	Elkl	Atha	Wem	FTMc	FtVe	Foot
Vesper Sparrow	65	3	43	99	50	20	4		3	19	10	9	29	28		8		1	
Lark Sparrow	36				31	8										1			
Lark Bunting	77		2	19	130	78													
Savannah Sparrow	78	4	45	104	44	4		3		23	35	31	271	293	3	77	2	13	
Baird's Sparrow	15				1									1					
Grasshopper Sparrw	4																		
LeConte's Sparrow		2		1		1		1			8			9					
Sharp-tailed Sparrow																			2
Fox Sparrow		1								9						1	1		2
Song Sparrow	26	2	4		8		46	5			45	51	24	42	5	10	6	2	5
Lincoln's Sparrow		2		2				15	5	7	3			8	5	1		3	
Swamp Sparrow										1				3	2				
White-throated Sparrow			2		1			1	4	1	50		5	22	8	13	4	8	22
White-crowned Sparrow	2	9	11	6	1		21	20	7	16	1	1		1					
Dark-eyed Junco		13		3			42	15	2	14	19			2		2		1	2
McCown's Longspur	1					7													
Lapland Longspur																			35
Chestnut-collared Longspur	86		5	8	19	40													
Bobolink			2								2		11	10					
Red-winged Blackbird	332	25	216	144	326	31	47	37	18	3	198	220	580	1123	21	129	2	54	56
Western Meadowlark	157	2	71	99	357	32		1		3	1	18	37	45	1				
Yellow-throated Blackbird	606	7	125	34	153	8		1			118	146	247	227		11	1	4	
Rusty Blackbird																	3	1	
Brewer's Blackbird	238	13	53	179	158	40	19	3		5	46	88	180	219		8	8		10
Common Grackle	75		9		71						6			7		3	8	6	
Brown-headed Cowbird	133	50	93	54	125	15	117	67	9	31	56	22	83	87	3	24	4	1	9
Northern Oriole	61	1	12	28	83	6					48	24	55	82	3	5		6	
Rosy Finch								8		2									
Pine Grosbeak								1		1									
Purple Finch							3				4			5		2	2		4
Cassin's Finch		3																	
Red Crossbill										2									
Pine Siskin	3	62		36	6	2	89	38	14	49	40			1		1	6		5
American Goldfinch	61	11	55	43	40	2					49	14	47	54		1			
Evening Grosbeak				1			2				4					2	6		1
House Sparrow	435		156	195	859	7		103			27	124	51	74	3	1	6	1	21
Total Species	149	105	112	122	118	89	82	98	53	85	123	88	129	167	74	115	67	108	83
Total Birds	12458	1118	4672	4753	9662	840	1794	1505	260	844	6807	4493	15016	18922	644	3051	426	2680	832

Legend:

Leth	Lethbridge
Wat	Waterton
Card	Cardston
Clar	Claresholm
Med	Medicine Hat
Bind	Bindloss
Bow	Bow Corridor/Sibbald
Banf	Banff/Canmore
Yam	Yamnuska
Sask	Saskatchewan River Crossing
Red	Red Deer
Buff	Buffalo Lake
Bea	Beaverhill Lake
Elkl	Elk Island
Atha	Athabasca
Wem	Wembley/Grande Prairie
FtMc	Fort McMurray
FtVe	Fort Vermilion
Foot	Footner Lake/High Level

1993 CALGARY MAY BIRD SPECIES COUNT - THE BIRDS

by Rodger Dunn

The following table lists all species observed by each group of observers. The locations they covered are listed below.

A:	Irricana, Saddler, Railway Sloughs, Dawson and Bruce Lakes	*Eric Tull, Jean and Rodger Dunn*
B:	North Weaselhead	*Andrew Holder, Jeff Schofield, Trygue Larsen*
C:	Big Hill Springs Prov. Park	*Joan and Malcolm McDonald*
D:	Namaka Lake	*Bill Wilson*
E:	Mallard Point	*Don Stiles*
F:	Brown-Lowery Recreation Area	*Nora and Ian Halladay*
G:	Edworthy Park	*Ena Spalding, John Bargman*
H:	Lowery Gardens	*Ena Spalding, John Bargman*
I:	Clay Hunt Ranch	*Clay Hunt*
J:	Glenbow Lake	*Suzanne Visser, Jamey Podlubny*
K:	Paskapoo Slopes	*Suzanne Visser, Jamey Podlubny*
L:	Inglewood Bird Sanctuary	*Linda Loberg, Lisa Esaiw, Deanna Campbell, Carol Himatsu, Kerin McIvor, David Bruon, Sue Dalley, Jane Petrin, MaryLou Iuliani, Jim Baker, Victoria Curkan, Ruth and Phil Ullman*
M:	Hwys 22X & 24	*Ruth MacRae, Howard Troughton*
N:	Dalemead Slough	*Ruth MacRae, Howard Troughton*
O:	Wyndham/Carseland Prov. Park	*Ruth MacRae, Howard Troughton*
P:	Bow Valley Prov. Park	*Jim Washbrook*
Q:	McKinnon Flats	*Ken Oakes, Jim Washbrook*
R:	Confederation Park, Queen's Park Cemetery	*Steve Kassai*
S:	Southeast area, Frank Lake	*Bill McKitterick*
T:	Bowmont Flats	*Horst Grothman*
U:	Ogden backyard	*Linda Joehnck*
V:	Riverglen backyard	*Verne Millar*
W:	Beaverdam Flats	*Kay and Mike Powers*
X:	South Glenmore, Weaselhead	*Joanne Jamieson, Gwen Simpson*

The author's address is: 8 Varbow Place NW, Calgary T3A 0B6

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Totals
Common Loon	1													1											2
Pied-billed Grebe	1		1			2				1															5
Horned Grebe	5	12	2																2					2	23
Red-necked Grebe	58		6											2		3			3						72
Eared Grebe	172		10	384										28					8						602
Western Grebe	31			69										7	1				7						115
American White Pelican	63														53		24								140
Double-crested Cormorant	31													54	10		20			27			1		143
American Bittern	2																								2
Great Blue Heron	5	1	1	3										2	4		2		2					2	22
Black-crowned Night-Heron	1			1																					2
Tundra Swan								6																	6
Gr. White-fronted Goose																				1					1
Snow Goose	1																								1
Canada Goose	285	109	115	62		17	10	74	2	2		18	160	190	24	31	42	26	23	85		7	38	48	1368
Wood Duck												3													3
Green-winged Teal	3		10	5								2	1				3		2						26
Mallard	226		14	27	5	8	3	18	2	8		12	72	30	19	7	10	60	34	18			32	16	621
Northern Pintail	111		14	5						4			18	6			8		18						184
Blue-winged Teal	175	12	85	31					10	32			75	26	9		8	2	38				1	4	508
Cinnamon Teal	21		10	9						1			2	1					3					2	49
Northern Shoveler	145	40	14	25						1			69	16			8		48					9	375
Gadwall	205		4	42						2		4	16	20	4		4	7	11						319
American Wigeon	28	15	4	1	2	14		1				4	8	10	4				15	2			2	9	119
Canvasback	19			90									2	4			2		8						125
Redhead	97			22									30	64	15		1		14						243
Ring-necked Duck	30		2	4		8				1						2									47
Lesser Scaup	194		21	105		11				2			50	160	12			4	14					2	575
White-winged Scoter				12										6											18
Common Goldeneye	2	4		11				4				6		2	8				4	6			1	2	50
Barrow's Goldeneye														2											2
Bufflehead	15		5	14									6	20		1			4						65
Hooded Merganser	1																4								5
Common Merganser	10				2			8				4			3				3	7			3		40
Ruddy Duck	157		20	67						4			4	16	2		1		13						284

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Totals
Osprey					1							1								2			1		5
Northern Harrier	11		1	1						1			3	1	2		3		2						25
Cooper's Hawk																								1	1
Northern Goshawk															1				1						2
Swainson's Hawk	30		1	2	1		2			1			8					1	13					1	60
Red-tailed Hawk	45	3	6	2		3	2	1	1	2	4	1	9	2	5		2		10	1				1	100
Ferruginous Hawk	1																								1
Golden Eagle			1																						1
American Kestrel	1				1							2			3				1	4			2		14
Merlin	1		1							1							2			1					6
Prairie Falcon			1																						1
Gray Partridge	8				2					1					3				2	1					17
Ring-necked Pheasant	2			1								1			2										6
Ruffed Grouse			1						2		1													1	5
Sora	6		7	3					3	1			2	1	1				3						27
American Coot	34		51	13		22							26	2		2	10		28						188
Black-bellied Plover	2			5									3	16											26
Killdeer	15		9	7		4				3			7	7		3	4		3	1				3	66
American Avocet	121												26						21						168
Lesser Yellowlegs										1															1
Willet	16			5									1	2			2		3						29
Spotted Sandpiper	3	12	4		1	1		7				1	1	16	14	17	10		23	5			2	8	125
Upland Sandpiper										5															5
Long-billed Curlew																	1		1						2
Marbled Godwit	17			8									2	6					4						37
Sanderling	12																								12
Semipalmated Sandpiper	125		6										4												135
White-rumped Sandpiper	2																								2
Baird's Sandpiper	57												2												59
Pectoral Sandpiper			2																						2
Stilt Sandpiper	15																								15
Long-billed Dowitcher	1												12												13
Common Snipe	19		29	4					4	1			9	1		2			1					1	71
Wilson's Phalarope	70		19	5						11			58	5		1	5		2						176
Red-necked Phalarope	30																								30
Franklin's Gull	6	55	50	200	35								52	40	150		40	13	450			9	40		1140
Bonaparte's Gull	4			17																					21
Ring-billed Gull	39		4		3			4					60	3400	20		200	1	3	65	2	2	15	500	4318
California Gull	607	114											20	600	16		1		14	6					1378
Common Tern	10														1										11
Forster's Tern	21			7											1										29
Black Tern	193		10	6		8				2			25	8					23						275
Rock Dove	87		11	4				10					2				10	11	12	14			5	1	167
Mourning Dove	5		2						3				1		2		4		5				5		27
Great Horned Owl	3						1																		4
Short-eared Owl	2												1	2					1						6
Ruby-throated Hummingbird		1																							1
Calliope Hummingbird																								1	1
Rufous Hummingbird		6														6									12
Belted Kingfisher												1			1					1					3
Yellow-bellied Sapsucker									1																1
Red-naped Sapsucker									2																2
Downy Woodpecker								1	2			1								2			3		9
Hairy Woodpecker															2								1		3
Three-toed Woodpecker																1									1
Northern Flicker	1	1	2		1	2		11	3			2			5			1		4			6	1	40
Olive-sided Flycatcher			1				1					2				1									5
Western Wood-Pewee	2		9		1		3	28	1		4	1			14		4	2	14	12	1		3	1	100
Alder Flycatcher			1								1									1					3
Least Flycatcher	10	12	22	2	2		2	22	20		27	3			30	5	20	2	19	8			2	40	248
Dusky Flycatcher																1									1
Eastern Phoebe	1	3	4															1			1			1	11
Say's Phoebe																	1								1
Western Kingbird	1		1												6				1						9
Eastern Kingbird	7			2	2			3		1		2	1	1	9		8		7	2			15		60
Horned Lark	18			6						1			4						17						46
Tree Swallow	16	20	24		5	6	12	2	8	1			4		60		40		15	2	3	1	30	40	289
Nor. Rough-winged Swallow	25		3												20		10			4			20	10	92
Bank Swallow	310	42	18					72			12				40	15			75	55				20	659
Cliff Swallow	202		100	10						50			110		100		75		20					10	677

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Totals
Barn Swallow	84		4	8			2		2	4			14	2				6	4	3				2	135
Gray Jay																4									4
Blue Jay		2						1	2											1				1	7
Black-billed Magpie	32	10	23	18	10	19	26	38		1	8	5	16	6	11		8	35	16	22	3	4	28	4	343
American Crow	16	8	12	17		6	20	12		2		4	8	1	10	2	4	9	19	5	2	1	6	5	169
Common Raven		1	2			3	2		2	1				1		2		1		2	1			4	22
Black-capped Chickadee	1	8	2		2	2	6	28	10		3	2				2	1	3	1	5			4	4	84
Boreal Chickadee			1			5																			6
Red-breasted Nuthatch			1						3											1					5
White-breasted Nuthatch								3				1												2	6
Rock Wren			4														3								7
House Wren	17	8	14	7	6	2	2	8	7		11	2			40		10	3	17	7			11	1	173
Marsh Wren	19			5																					24
Golden-crowned Kinglet						4																			4
Ruby-crowned Kinglet			8			1		4	1							5			1					5	25
Mountain Bluebird			25			12	2		4										5						48
Veery		2									7				9						1			3	22
Swainson's Thrush	1		2					1										2	4	4	1				15
Hermit Thrush			1						6																7
American Robin	16	10	17	7	3	22	8	40	8	1	7	5	2		30	10	20	52	24	25	2		13	4	326
Gray Catbird		3						7			6				1		2								19
Brown Thrasher		2													2					2				1	7
Sprague's Pipit	4		3							1	1														9
Cedar Waxwing		4				6					4				9				1		15			2	41
European Starling	31	3	29	49	11	7	20	70	2	6		50	32	6	86	5	30	37	31	60	8		50	3	626
Warbling Vireo	5		6	1	2			5	4						6		1		1	9					40
Philadelphia Vireo																	1								1
Red-eyed Vireo	1		1					3	2		2				2	1				2				4	18
Tennessee Warbler						3		1	10																14
Orange-crowned Warbler											3									1					4
Nashville Warbler																				2					2
Yellow Warbler	20	12	45	4	2		3	45	1		18	6	3		35	2	20	2	28	10			13	42	311
Yellow-rumped Warbler								1	3							12		2		1			1		20
Blackpoll Warbler	1					1												1						3	6
Ovenbird						1			4																5
Northern Waterthrush			2													1								2	5
MacGillivray's Warbler									4		1					2									7
Common Yellowthroat	6		6	4	1			1						2	4					1				6	31
Western Tanager																								1	1
Rose-breasted Grosbeak									11															1	12
Lazuli Bunting						1																			1
Rufous-sided Towhee																			1						1
Chipping Sparrow	1	6	14			6	8	30	3	2	13		1		2	4	4	12	2	8	2	1		9	128
Clay-coloured Sparrow	41	3	39	21	2	4	8	9		5	11		7	15	22		10	2	17	6			1	30	253
Brewer's Sparrow								2																	2
Vesper Sparrow	44		2	19			1			4	4		13		6		10		12	1					116
Savannah Sparrow	70		15	64	1		2	1	2	6	2		30	24	6		5		11					6	245
Baird's Sparrow	3																								3
LeConte's Sparrow			12	6					1	2	1														22
Sharp-tailed Sparrow	1																								1
Song Sparrow	4	2	8		3		1	10				1			13		4		8	4			2	2	62
Lincoln's Sparrow	1		3			2		4	3		2					1				3					19
White-throated Sparrow		3	6					1	4		17				1				3					4	39
White-crowned Sparrow																4			1	1					6
Dark-eyed Junco									4							20				2					26
Chestnut-collared Longspur	4																								4
Red-winged Blackbird	351	2	41	139	4	32		55	13	3		4	100	40	32	20	30	6	42	7		2	8		931
Western Meadowlark	48		2	20						8			10	4	3		5		11					1	112
Yellow-headed Blackbird	289		22	62		6							100	20			50		28			1			578
Brewer's Blackbird	67	20	22	12	5	7	6	4		7			20		4	6	50		18		3	1	3	4	259
Common Grackle	2													4	4						5				15
Brown-headed Cowbird	18		9	5	1	8		16	30		1		10	10	10			1	20	14	1	4		1	159
Northern Oriole	7	2	4	2	1			48	3		2	12			18		10	1		6			23		139
Purple Finch									2																2
Pine Siskin	1	6	11			6			8		3										5			11	51
American Goldfinch	7	2	14		3	2	6		1		13	1			8		3		2	6	4			4	76
Evening Grosbeak					1				3																4
House Sparrow	74	20	86	23		10	12	6				2	42		40			27	14	5	30	10	2	3	406
Total Birds	5596	601	1257	1792	122	284	171	726	227	194	189	166	1374	4912	1090	201	870	333	1410	563	90	43	393	912	23516
Species	111	41	87	63	32	39	27	46	47	42	29	33	57	52	66	34	57	31	80	58	19	12	36	60	173

(Reprinted from Pica, Summer Volume 14, No. 3, 1994)

1993 May Species Count for Birds and Mammals: The Mammals

LEGEND:

X - Present

T - Tracks

S - Scent

LETH	Lethbridge	BUFF	Buffalo Lake
WATE	Waterton	BOWC	Bow Corridor
CARD	Cardston	ELKI	Elk Island
CLAR	Claresholm	ATHA	Athabasca
REDD	Red Deer	GRAN	Wembley/Grande Prairie

MAMMAL SPECIES	LETH	WATE	CARD	CLAR	REDD	BUFF	BOWC	ELKI	ATHA	GRAN
Nuttall's Cottontail	2									
Snowshoe Hare					3	1				2
White-tailed Jack Rabbit	8		8			2				
Least Chipmunk		1								
Yellow-b. Marmot	25		23							
Hoary Marmot		1								
Richardson's Ground Squirrel	67		40	30		117		50	1	
Columbian Ground Squirrel		10		6			X			
American Red Squirrel		2			6		X	6	1	
Northern Pocket Gopher	T									
American Beaver	1	3	2				X	2		
Muskrat	5		2	4		8			1	2
American Porcupine	1									
Meadow Vole	1									
Coyote	6		3	3	1		X	10	3	1
Red Fox	1		3							
American Black Bear		1							T	3
Grizzly Bear										1
Raccoon	T									
Long-tailed Weasel			1							
American Mink					1					
American Badger	T		4							
Striped Skunk	S		1	1						
Mule Deer	22	10	26	11	3		X			
White-tailed Deer	4	9	23	3	3	1		6	2	4
Moose			2		1			7		1
Wapiti (Elk)		2			6		X	20		
Pronghorn (American Antelope)	8		37							
Mountain Goat							4			
Bighorn Sheep							X			
Bison		20						10		
TOTAL No. of Species - 31	17	10	14	7	8	6	9	8	6	7

Recent Articles on the Natural History of Alberta.

Compiled by Don Albright[1] and Dave Ealey[2].

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Plant List - Prospect Creek and Cardinal Divide

FAN Summer Field Trip Led by Jim Lange

Don Stiles

The following is a list of flowering plants observed on two hikes in the Cadomin area which were part of the FAN 1994 summer field trip.

On the Prospect Creek hike on 23 July 1994, we hiked along the creek for three kilometers before climbing a steep ridge to an alpine area. This steep hike was negotiated before lunch by those who were fit, but completed after lunch by those who were older or unfit, myself included. The starting elevation of the hike was 1700 m (5600 ft.) and the alpine area was at approximately 2040 m (7000 ft.).

The Cardinal Divide hike on 24 July started at 1980 m (6500 ft.) and the alpine zone was at approximately 2200 m (7200 ft.). On both hikes we visited north-facing slopes on ridge tops where we found a number of distinctive alpine flowering species.

Two features have been added to the list to make it more useful:

1. An "A" has been added at the beginning of the line if the plant has been designated "alpine" in *The Flora of Alberta* (Moss 1983).
2. For those who are new to botany, or find pictures of value in identifying plants, an "S" has been added for those plants with pictures in *Wildflowers of the Canadian Rockies* (Scotter and Flygare 1986), and an "N" for those not pictured in the above, but pictured in *Plants of Northern British Columbia* (MacKinnon et al.1992). The list below includes 84 species of which 74 can be found with pictures in at least one of either of these two books. Where Moss (Packer) has changed the name of the species, the old name is in brackets to make comparison to the above mentioned books easier.

Plants listed are in flower except for a few special cases noted as "in fruit". An "e" indicates the plant was nearing the end of the flowering season and just a few specimens were still in bloom. "P" indicates Prospect Creek and "C" Cardinal Divide.

Due to time constraints, we did not take the time to key out difficult or unknown plants on this trip.

***Liliaceae* - Lily Family**

			P	C
S	*Veratrum eschscholtzii*	False Hellebore	+	
S	*Zigadenus elegans*	White Camas	+	+

***Orchidaceae* - Orchid Family**

S	*Habenaria viridis*	Bracted Orchid (in fruit)	+	

(This orchid is found in moist places. The plant was common on the Cardinal Divide, although the area looked too dry for it.)

***Polygonaceae* - Buckwheat family**

			P	C
A S	*Oxyria digyna*	Mountain Sorrel (in fruit?)		+
	Polygonum viviparum	Bistort	+	+

***Caryophyllaceae* - Pink Family**

N	*Cerastium arvense*	Mouse-ear Chickweed	+	
A S	*Silene acaulis*	Moss Campion	+e	+e
	Stellaria longifolia	Long-leaved Chickweed	+	
N	*S. longipes*	Long-stalked Chickweed	+	

***Ranunculaceae* - Crowfoot (Buttercup) Family**

A N	*Aconitum delphinifolium*	Monkshood	+	+
A S	*Anemone occidentalis*	Western Anemone	+e	
N	*Delphinium glaucum*	Tall Larkspur	+	
N	*Ranunculus acris*	Tall Buttercup	+	
A S	*R. eschscholtzii*	Alpine Buttercup	+	

***Cruciferae* - Mustard Family**

	Erysimum inconspicuum	Prairie Rocket	+	

***Crassulaceae* - Stonecrop Family**

S	*Sedum lanceolatum*	Common Stonecrop	+	+

***Saxifragaceae* - Saxifrage Family**

A S	*Saxifraga adscendens*	Wedge-leafed Saxifrage		+
S	*S. bronchialis*	Spotted Saxifrage	+	+
A S	*S. lyallii*	Red-stemmed Saxifrage (in fruit)		+
A	*Telesonix heucheriformis*		+	

(This rare plant, found on limestone outcrops, was one of the highlights of the trip. It has reddish, cup-shaped flowers and kidney-shaped leaves.)

***Parnassiaceae* - Grass of Parnassus Family**

N	*Parnassia palustris*	Grass of Parnassus	+	

***Rosaceae* - Rose Family**

A S	*Dryas octopetala*	White Mountain Avens	+e	+e
S	*Fragaria virginiana*	Wild Strawberry	+	
A S	*Potentilla diversifolia*	Mtn. Meadow Cinquefoil	+	
S	*P. fruticosa*	Shrubby Cinquefoil	+	
N	*P. gracilis*	Graceful Cinquefoil	+	
A S	*P. nivea*	Alpine Cinquefoil		+
N	*P. pensylvanica*	Prairie Cinquefoil	+	
S	*Rosa woodsii*	Wild Rose	+	

***Leguminosae* - Pea (Legume) Family**

	Astragalus americanus	American Milk Vetch	+	
S	*Astragalus vexilliflexus*	Few-flowered Milk Vetch	+	
N	*Hedysarum alpinum*	Alpine Hedysarum	+	+
S	*H. boreale var. mackenzii*	Mackenzie's Hedysarum	+	+
S	*Lathyrus ochroleucus*	Wild Peavine	+	
S	*Oxytropis monticola*	Late Yellow Locoweed	+	+
A S	*O. podocarpa*	Bladder Locoweed (in fruit)		+
S	*O. splendens*	Showy Locoweed	+	
	Trifolium hybridum	Alsike Clover	+	

***Leguminosae* - Pea (Legume) Family**

			P	C
N	*Trifolium pratense*	Red Clover	+	
	T. repens	White (or Dutch) Clover	+	
N	*Vicia americana*	Wild Vetch	+	

***Onagraceae* - Evening Primrose Family**

S	*Epilobium angustifolium*	Common Fireweed	+	
A S	*E. latifolium*	Mountain Fireweed	+	

***Umbelliferae* - Carrot Family**

S	*Cicuta maculata*	Water Hemlock	+	
S	*Heracleum lanatum*	Cow Parsnip	+	

***Pyrolaceae* - Wintergreen Family**

S	*Moneses uniflora*	One-flowered Wintergreen	+	+
S	*Pyrola asarifolia*	Common Pink W'green	+	
S	*P. chlorantha*	Green-flowered W'green	+	

***Ericaceae* - Heath Family**

A S	*Cassiope mertensiana*	White Mountain Heather	+e	+e

***Primulaceae* - Primrose Family**

A S	*Androsace chamaejasme*	Sweet-flowered Androsace	+	+
	A. septentrionalis	Fairy Candelabra	+	

***Gentianaceae* - Gentian Family**

S	*Gentiana prostrata*	Moss Gentian	+	+
N	*Gentianella amarella*	Northern Gentian, Felwort	+	+
A S	*G. propinqua*	Four-parted Gentian	+	+

***Polemoniaceae* - Phlox Family**

N	*Polemonium acutiflorum (caeruleum)*	Tall Jacob's Ladder	+	+

***Boraginaceae* - Borage Family**

N	*Mertensia paniculata*	Tall Lungwort	+	
A S	*Myosotis alpestris*	Alpine Forget-me-not	+	+

***Scrophulariaceae* - Figwort Family**

S	*Castilleja miniata*	Red Indian Paintbrush	+	
	C. occidentalis	Yellow Indian Paintbrush	+	+
S	*Pedicularis bracteosa*	Bracted Lousewort	+	
S	*P. groenlandica*	Elephant Head	+	+
S	*Penstemon procerus*	Slender Blue Beard-tongue	+	
S	*Rhinanthus minor*	Yellow Rattle	+	

***Rubiaceae* - Madder Family**

S	*Galium boreale*	Northern Bedstraw	+	

***Campanulaceae* - Bluebell Family**

S	*Campanula rotundifolia*	Harebell	+	
A S	*C. uniflora*	Alpine Harebell	+	+

***Compositae* - Composite Family**

S	*Achillea millefolium*	Common Yarrow	+	+
S	*Agoseris glauca*	False Dandelion	+	+
S	*Anaphalis margaritacea*	Pearly Everlasting	+	
S	*Antennaria rosea*	Pink Pussytoes	+	
S	*Arnica cordifolia*	Heart-leaved Arnica	+	
A S	*A. louiseana*	Lake Louise Arnica	+	+
N	*Artemisia michauxiana*	Michaux's Wormwood	+	+

***Compositae* - Composite Family**

			P	C
S	*Cirsium hookerianum*	White Thistle	+	
	Erigeron caespitosus	Tufted Fleabane	+	+
A S	*E. compositus*	Daisy Fleabane	+	
S	*E. peregrinus*	Tall Purple Fleabane	+	+
N	*Hieracium aurantiacum*	Orange Hawkweed	+	
S	*H. triste (gracile)*	Slender Hawkweed	+	+
A S	*Saussurea nuda*	Saw-wort	+	
A S	*Senecio lugens*	Black-tipped Groundsel	+	+
N	*S. pauperculus*	Balsam Groundsel		+
A S	*Solidago multiradiata*	Rocky Mountain Goldenrod	+	+
N	*Taraxacum officinale*	Common Dandelion	+	

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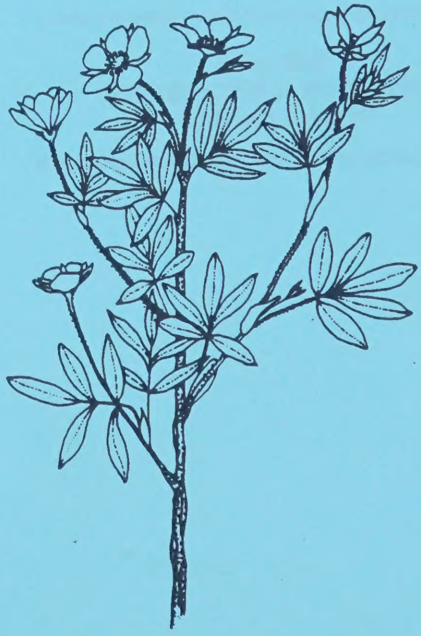

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